LIVE ARTICLES ON MARINE INSURANCE

No. 1

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July 22, 1919.

LIVE ARTICLES
ON
MARINE INSURANCE

A Series of Articles Reprinted from

The Weekly Underwriter

1917-1918

PRICE $1.05

The Underwriter
Printing and Publishing Company
New York

FOREWORD.

This volume, like the Live Articles series on fire and liability insurance, is made up of articles reprinted from THE WEEKLY UNDERWRITER, which for the past year has contained at least one article on marine insurance each issue. The articles are by men who speak with authority, whose word is the last word, each in his respective line.

The articles have met with a growing appreciation and with a general commendation that is distinctly encouraging, and it is hoped that in this their collected form, by fulfilling a real demand, they will meet with a real success.

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THE OLDEST FORM OF INDEMNITY.

By J. B. Levison.

President Fireman's Fund of California

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As many of you doubtless know, marine insurance is the very oldest form, and, in fact, the only ancient form of indemnity. History tells us that as far back as 800 B.C. the Rhodians had something of the nature of marine insurance, and they are generally credited with having been responsible for certain features, at all events, of marine insurance as we know it to-day.

About the twelfth century, when the commercial activity in the Mediterranean began to show itself, marine insurance played quite an important part in the trading between individuals. As a matter of fact, the whole development of marine insurance is allied, naturally, very closely to the birth and development of commerce and trade. From 1200 to 1600 A.D. was, it might be said, the constructive period and about the thirteenth century the Lombards introduced marine insurance into London; in fact, the present policy known as "Lloyd's policy" bears a very striking resemblance to a Florentine statute describing a form of policy which was dated about 1500.

In those days in London, the socalled "coffee house" occupied rather a unique position in the commercial world, being a sort of meeting place for merchants, shipowners and masters. From these coffee houses subsequently developed the Shipping Exchange or Bourse over the entire continent. One of the best known coffee houses in London at that time was kept by a man by the name of Lloyd, and was known as Lloyd's coffee house.

Shippers, merchants and captains used to meet in this place, which during the last half of the seventeenth century became a very well known rendezvous for all persons connected with shipping. Lists were kept, giving the particulars of vessels, their age, construction, ownership, etc., as well as a record of their voyages. Finally a plan of mutual insurance was adopted by which, for an agreed compensation, the individuals would guarantee each other against loss. Lloyd appears to have been an enterprising man and at last, probably by way of publicity and as an attraction for his coffee house, started in 1696 the publication of a weekly shipping and commercial paper called

Lloyd's News, which was a forerunner of *Lloyd's List,* started in 1726 and now the most widely known shipping paper in the world. From Lloyd's coffee house also emanated the lists giving the particulars of the construction and condition of vessels, which doubtless was the beginning of *Lloyd's Register*—the acknowledged authority on the classification of vessels the world over.

This leads me to say a word about Lloyd's underwriters, who also came out of Lloyd's coffee house, in that certain patrons of the coffee house "underwrote" policies of insurance, as it was then called, and to which I have already referred, decided to start an association, so that they might have a place for the transaction of their particular business exclusively, and from this has grown the Lloyds of to-day.

It would probably surprise some of you to know that the word "Lloyd's" has nothing to do with matters maritime, strictly speaking. We naturally have got into the habit of thinking so from the fact that the names of so many different kinds of concerns connected with the sea, such as steamship companies, vessel registers, etc., use the word "Lloyd's." It has all come from the original Lloyd's coffee house.

I will take a moment to tell you something of Lloyds underwriters and their method of doing business. Lloyds room is a large room on the second floor of the Royal Exchange in the heart of the city of London. In this room several hundred underwriters sit at their desks from 10.00 in the morning until 4.00 in the afternoon, considering proposals for insurance presented to them by hundreds of brokers and their clerks. In this room is written every class of insurance known to the business world, and while originally Lloyds underwriters wrote only marine insurance, to-day, as I have just said, they write anything and everything of whatever character. The result of this, as can be readily understood, is that the institution is an exceedingly attractive one for brokers and, as a matter of course, the volume of business done by Lloyds underwriters is tremendous.

To come back now to marine insurance.

Probably, in view of the fact that I am speaking to a body of men employed generally in the fire insurance business, it might be well for me to say a few words by way of comparison. Fire insurance and marine insurance have absolutely no relation whatever to each other. It is merely a coincidence that certain companies happen to be doing both classes of business. There is absolutely no similarity whatever, nor connection between the two—in fact, at many points marine insurance is as different from fire insurance as it is from life insurance or any other form of insurance.

For example, the policy generally used by marine under-

writers is one which has come down to us from the fifteenth or sixteenth century and clauses are inserted to meet the particular requirements of the business in hand. In fire insurance the form is laid down by the State, and changed to meet the views of State insurance departments and individuals, rather than the insuring public. In marine insurance tariffs are of the greatest rarity, rates being fixed by individual underwriters; in fire insurance it is the custom the world over to write according to tariff almost altogether. In marine insurance the policy is practically always a valued policy; in fire insurance, to even suggest a valued policy is to throw the underwriter almost into a state of panic.

In marine insurance it is not at all an unusual thing for an underwriter to relieve himself of liability by re-insuring his entire line on any given risk; in fire insurance this is practically unknown, and considered unethical, if nothing worse.

A marine policy once written can not be cancelled, except, of course, by mutual consent. Every fire policy contains a clause providing for cancellation by either party.

Marine insurance is world wide and cannot be controlled locally in any respect. Fire insurance is strictly local and can be controlled accordingly.

The first stock companies for the transaction of marine insurance were organized and chartered in England in 1720 and in America in 1792. Up to the time of the present European war there were less than a dozen American companies doing marine insurance business. To-day, as a result of the war and the anticipated development of the American merchant marine, practically every American fire insurance company of any importance has taken up marine insurance also.

It is not necessary for me to say to an organization such as yours that without marine insurance there could be no commerce. Marine insurance makes it possible for a merchant with a limited capital to do a comparatively large business.

As to the scope of marine insurance, I hardly know where to start, it is so broad, and so different from anything that the average fire underwriter, with no definite knowledge of the situation, imagines.

For example, a very large business is that of insuring cargoes on vessels carrying a refrigerating plant against the breakdown of the plant and the consequent spoiling of the cargo. Another is the practical guaranteeing of profits by insuring against the safe arrival of the vessel. If time permitted I could give you many similar interesting illustrations of the kind of risks marine underwriters are expected to take.

In the old days of sailing vessels, before the advent of steam, the character of the business was entirely different from the present time. To-day, with the commerce of the world carried

on by steamers and all the ports of the world connected by cable, the business is of a much simpler character.

A feature of the marine business which I should probably say a word about at this particular time is that of war risk insurance, which is a subject of common interest and discussion. The ordinary marine insurance policy does not cover what is popularly known as "war risks." In other words, it specifically excepts any losses due to the seizure, detention or sinking on the part of a belligerent, and in order to have this risk covered, it is necessary to add a special clause for which an additional premium is charged. During the last three and a half years many companies have written a large business with very satisfactory results, for the reason that while losses by the submarines in European waters have been quite heavy, the losses throughout the rest of the world have been comparatively light, notwithstanding which fact merchants and bankers have protected their shipments, wherever they might be, by war risk cover.

There are a few technical expressions to which I might refer as doubtless many of you have heard them and been mystified by them, to a greater or less degree, and I will ask you to bear with me a few minutes longer so that I may very briefly touch upon them.

The first is "general average." General average is simply a sacrifice made or an expense incurred for the general benefit. Take a very simple illustration: A captain finds his vessel dangerously close to the rocks and employs a tugboat to tow him clear of danger. The value of the cargo is $100,000 and the value of the vessel is $100,000 and the tugboat's bill is $2,000. Under these circumstances the vessel will pay half and the cargo will pay half of the bill. Of course, you understand that I have given you a very primitive illustration, shorn of all complications and technicalities, of which there are naturally many, even in a case as simple as this one.

TECHNICAL EXPRESSIONS.

"Particular average" is, roughly speaking, a technical expression for "partial loss." "Hull" is the body of the vessel itself. "Freight money" is the compensation paid the owner by the cargo for its carriage. "Average statement" is nothing more nor less than a "proof of loss," as it is called in the fire business.

One very important feature of the marine business is the implied warranty of seaworthiness. There are present, in all contracts of insurance, two classes of warranties—expressed and implied. The expressed warranty is the warranty contained in the policy itself; the implied warranty is one that, as the expression indicates, is understood between both parties.

The most important implied warranty is that of seaworthiness, which means that the vessel must be in seaworthy condition for the contemplated voyage, in order that the policy of insurance may be valid. This implied warranty of seaworthiness covers the condition of the vessel and her equipment, and also the character of her crew. It is of the highest importance, in placing marine insurance, that any feature which might influence the underwriter in making the rate, should be disclosed. A failure to do so may invalidate the entire insurance.

MARINE INSURANCE.

Historical Sketch of Marine Insurance—How It Differs from Fire Insurance—Definition of Terms.

By Sir Douglas Owen.

An Address Before the Insurance Institute of London.

Now, if you were asked, what should you say was the most essential point of difference between fire insurance and marine insurance? It might occur to you that the one is an insurance of fixed property on land, the other an insurance of moving property at sea. Such a distinction is, however, no longer what it once was. Fire insurance, no doubt, is constancy itself, and at any rate it will not insure property which is at sea. Marine insurance has one foot at sea and one on shore. It insures tea and tobacco before they are plucked and until loaded, as well as on their homeward voyage across the seas. It insures wool from the time it is sheared, while it is being baled, while it is in transit, and after landing, until it gets to Bradford. The whole journey by land and sea and a bit more is covered—and fire is, of course, one of the risks included. And for the risk at the docks at each end of the journey, and in transit sheds, the marine insurance policy gives protection against fire and other risks. The marine underwriter, whether at Lloyd's or at the companies, is a poacher born and bred; if under the plea of transit risks he can manage to cast his net over a bit of the fire insurance companies' business, he does so gladly. And so you will sometimes find, when dock warehouses or transit sheds are burned down, that the goods, while under the protection of a fire insurance "floater," are also under a policy of marine insurance. They are, in fact, doubly insured, and each set of underwriters should in such circumstances pay half the loss. But the fire insurance companies, by whom marine insurance poaching is regarded much as the devil is popularly supposed to view holy water, have invented an artless little clause which leaves the poachers to pay the lot. You will remember the so-called "Marine Clause," under which the fire company disclaims liability for—

(g) Loss or damage to property, which at the time of the happening of such loss or damage is insured by, or would, but for the existence of this policy, be insured by any marine policy or policies, except in respect of any excess beyond the amount which would have been payable under the marine policy or policies had this insurance been effected.

But what, then, is the essential point of difference between the fire policy and the marine policy? I should say it was this: That whereas, under a fire insurance policy, no one is entitled to claim more than the actual amount of his loss (I have heard the ungrateful say that he is one of fortune's favorites if he gets anything like as much) the actual value in a marine insurance, is practically beside the question. Take the case of a shipment of wool or cotton—or tea or tobacco, if you like. The sanguine shipper believes or supposes that the matter is likely to go up and that, though the value of the goods on shipment may be £500, when they get to market they will be worth £700 or £800, and for that sum he insures. The market does not go up; it may even go down. The ship goes ashore and breaks up just outside her destination, and though it is indisputable that if the goods had arrived they would only have fetched £500, perhaps not so much, the shipper is entitled to receive the full £700 or £800 insured. The marine insurance policy, ninety-nine times out of a hundred, is what is called a "valued policy": the value is admitted in the policy, and in the absence of mistake, fraud or an over-insurance so gross as to amount to concealment of a material fact, this value or valuation cannot be questioned. It is painful to me to have to record a circumstance so shocking to the fire insurance conscience—but there it is! And I think that in this fact we have the essential—or at any rate a very great—distinction between the fire and the marine insurance policy. And let me make a clean breast of it and confess that marine insurance men even take a shameful pride in the distinction. There is, however, occasion neither for indignation nor for boasting in the matter. Both usages, both laws, are founded on good sense. And the broad operating factor I take to be this: that the property insured against fire is as a rule in the power and possession of the owner, and if he chooses to set fire to it he can do so with no physical risk to himself and with the belief that the fire will destroy all the evidences of his dishonest act. Therefore, it would be contrary to the public interest and safety to let a man stand to make a profit under his fire policy.

Property at sea is in a different position. It is ordinarily in the charge of independent people who have no pecuniary interest in it, and who cannot destroy it without at the same time imperiling their own lives and the lives of all on board. I don't mean to say that this is an absolute safeguard—there are sufficient illustrations to the contrary; but as a broad general rule it holds good. Then there is another reason, that voyages sometimes take long—though nothing like so long now as in the old days when marine insurance had its beginning—and a shipment when it arrives at its destination may well be worth a

great deal more than it was worth at the time it was put on board; and merchants are allowed to insure accordingly.

This, I think, is perhaps the chief of the many ways in which marine insurance differs from fire insurance. It means that in the marine policy, the value of the property is definitely fixed on the signing of the contract. The market may climb to the hills or it may dip to the hollow; a total loss of the goods may be a bit of bad luck for the assured (this happens; but very seldom) or it may be to his undisguised good fortune; he gets the exact sum insured, no more and no less, in either event.

I may, perhaps, mention another point of difference, though it only occasionally takes effect. The amount of your fire insurance policy is the outside amount of your liability. Not so with the marine policy. Take the case of an insurance, as it is expressed, "on hull"; that is to say, on the ship herself as distinguished from the cargo. Shortly after sailing, the ship, by her own bad navigation, is heavily damaged by collision. She puts into port and is repaired, and the underwriters pay the bill. She may get into other trouble after sailing again and incur further repairs, and the underwriters are liable for that, too. Finally, she goes ashore at her destination and breaks up, or is totally destroyed by fire; and the underwriters are liable for the whole sum originally insured, without any deduction for the previous payments.

MARINE POLICY WORDING.

We have been discoursing on some of the differences between the scope or effect of the fire policy and that of the marine policy, but in their language and construction the two documents are almost as different as chalk and cheese. Now, what am I to say about the form and wording of the marine policy? Am I to put myself in a white sheet and shake a deprecating head; or, having myself an antiquarian taste and greatly relishing the smack of words and phraseology long obsolete, shall I proudly declare that, from this point of view, there is no policy like the marine policy? And indeed there is not. For the policy of to-day, in all its fascinating quaintness, is as nearly as may be the policy of three hundred years ago, and for all I know, of a time much earlier. As to the origin of marine insurance, it is lost in antiquity, the English form of policy probably being a translation of that earlier in use in Italy. And one and the same form is to-day used to cover almost any kind of risk you can think of, the same form as was originally framed to meet the case of ancient navigation. To use a homely illustration, the stereotyped marine policy form is like the navvy's iron bucket, which in its early and polished days is used solely for acquatic purposes. Later, becoming leaky, we find it supplementing the uses of the hand-barrow; and finally, punched full of

holes, it serves as a useful stove for the melting of lead or giving to the noonday air an appetizing odor of broiling steak. The insurance may be on sovereigns, on frozen meat, on tobacco leaves in a drying shed, on tea on the growing plant. Never mind: the policy starts out by declaring itself to be an insurance on the "body" of the "good ship or vessel" named, with all her "tackle, apparel, ordnance, munition, artillery, boat," and so on. Only one boat, be it noted, probably in the early times all she could carry. It is an "omnium gatherum" wording which is about as applicable to modern needs as the navvy's bucket is for making butter. Lest you should regard this description as unduly picturesque, let me quote the words of one of His Majesty's judges (the late Mr. Justice Walton) in one of his judgments not many years ago. This is what he said:

"The difficulty in this case arises from the very peculiar way in which contracts of marine insurance are expressed. A printed form which dates back to the eighteenth century (early in the seventeenth century, he should have said) is used as a basis of the contract. In this form there are certain blank spaces in which it is usual to insert a description of the subject-matter of the insurance or of the special line of indemnity intended to be given by the policy. It not uncommonly happens that the words written in the blank spaces of the form have no connection with the printed words which precede or with those which follow them. In almost all cases certain parts of the printed form have no application to the risk described by the written words. Sometimes it will be found that many even of the special clauses contained in printed slips gummed on to the policy have no possible application to the actual insurance. Cases are not uncommon in which the whole contract is contained in the written definition of the termini of the voyage, and a few written words inserted below in some blank space in the form, none of the printed clauses of the form being applicable at all; the well-known course of business in formulating contracts of marine insurance."

The learned judge mentioned "special clauses gummed on." Clauses are, in fact, gummed on galore—gummed on, plastered on, stamped on. There are policies which seem, at first sight, to be a sort of documentary hoarding for the display of contractual notices—some of which, as the learned judge justly observed, have no possible application to the actual insurance.

I don't hesitate to say that if such a system were to be seriously proposed as a new thing to-day it would be received with a shout of incredulous laughter. "Then," you will exclaim, "Why not alter it?" Alter it! Not for worlds! Since the days of good Queen Bess the courts have never ceased to determine in case after case innumerable, the exact meaning to be attached

to every clause, every sentence, every single word, I may say, of the ancient and incoherent contract, and by the light of this interpretation all the further clauses gummed on, plastered on and rubber-stamped on have to be and daily are interpreted. It is true that in the last few years the law of marine insurance has been codified, whereas, before, it was scattered up and down in the law reports like plums in a cake; but the hoary policy and the legal decisions founded on its every word are the warp and woof of the marine insurance act. Consequently, if the almost Biblical language and archaic terminology and arrangement of the policy were to be altered so as to make it as clear and simple, as spick and span as we all know the fire policy to be, the mercantile community would be cast headlong from the firm ground of well-known and well-understood law into the quicksands of uncertainty and dispute.

Before we go further I would like to say a word or two about that beautiful term—a veritable "Mesopotamia" to fire insurance men—Indemnity.

CONTRACTS OF INDEMNITY.

The policy of marine insurance is, as we know—like the policy of fire insurance and of accident insurance—a contract of indemnity. Now, fire insurance people, brought up in the sure and certain faith that under a contract of indemnity the assured can recover no more than he has lost—that is the best that can happen to him—may well wonder how, when the contract of indemnity is one against marine risks, he can be legally entitled to recover a possibly larger speculative profit in addition. The fact is, I think, first, that the description "contract of indemnity" is merely a generic one, as distinguished, say, from a contract of carriage, a contract of hiring, and so forth. It is a contract to indemnify. Whether the indemnification actually agreed upon shall be half the amount of the actual loss, or the exact amount of the actual loss, or the actual loss plus an estimated or speculative profit is beside the question so far as concerns the type of contract, which in all of these cases is still and always what the law calls a "contract of indemnity." Now, second, it so happens that the fire policy is really a contract of indemnity as this word is commonly understood; the assured cannot recover more than his actual loss. But that is because of the express provisions of the fire policy. He cannot recover more than this, not because the insurance contract is a "contract of indemnity," but because the fire insurance contract is a form which gives him no more than an indemnity. The marine insurance form gives him what may be, and very often is, a great deal more than an indemnity, though it may also be a good deal less.

So that, as I have conveyed, the fact seems to be that the term "contract of indemnity," like many other terms, is used

in two different senses: the one which merely describes the category or class to which the contract belongs—and this takes in the marine insurance policy; the other, which defines the scope of the policy itself, which makes the fire policy a contract of indemnity in both senses. Our language contains many such ambiguities. "Salvage" is another of them. Look up in the dictionary and you will find three separate and distinct meanings given to it. There is the property which is saved by an act of salvage; the work or service rendered in the process; the money award or reward for the successful rendering of the service. Look, again, at the word "insurer," which may impartially mean the owner of the goods which he causes to be insured, or the underwriter who grants a policy on them. To avoid this ambiguity the owner of the goods is frequently referred to in marine insurance circles as "the Assu'red"—accent on the "red."

SALVAGE.

But let us go back to salvage. You fire insurance people are familiar with two of its meanings, the process of salving and the product of the work, but of the other meaning, "salvage award," you probably have no, or very little, practical experience. It is, however, a frequent charge on marine insurance policies. A broken-down steamer is towed into port; a stranded vessel is got afloat; a fire in the hold is extinguished by the aid of another crew; in all these cases "salvage" is awarded, and the payment is borne pro rata by all the parties benefited, who in turn recover from their underwriters.

Now, salvage, in the sense of salvage award, is a very curious thing. It is an attribute, a very ancient attribute, solely of the sea. As such, it has been incorporated in the merchant shipping act, so that the liability to pay salvage frequently arises under the marine insurance policy. But this ancient law of the sea is construed with the utmost strictness. It is not merely because property is picked up at sea and salved that its recoverers can claim salvage. No; the only property giving rise to such a claim is a ship or wreck or any of her apparel, or cargo out of a ship or wreck—and nothing else. Now, a few years ago, a floating navigation gas beacon got adrift off the Humber and was saved by two punt-gunners who smothered her light and brought her into safety. By so doing they not only saved £600 worth of Trinity House property, but removed a danger to navigation. Trinity House offered them £6 as a gratuity. They declined it and claimed salvage. I should tell you that this beacon was ship shaped, about fifty feet long and twenty feet beam and bow-shaped at both ends. She had no mast or rudder, but was provided with a hold in which the gas was stored. The salvors' claim was tried in four different courts, the last of

these the House of Lords. The Lords decided that the beacon was not a ship or a wreck and that the gas in her was not cargo; consequently that the Trinity House was not liable to pay salvage to those who recovered her, though there was no law to prevent their paying a gratuity if they liked. A bad day's work for the punt-gunners when they brought her in! In these times of German lawnessness, when merchant ships which have been torpedoed do not always sink, there is a fine chance for salvors, and the underwriters pay, for the most part, cheerfully. But unless the property picked up at sea comes within the strict definition of the act, nothing at all is legally due; the "salvor" is in the same position as you are if you dash into a burning house and save a valuable picture. Except under the merchant shipping act, no one can impose a legal liability on another by saving his property—or his life—unasked.

FIXING OF PREMIUMS.

Rightly or wrongly—I dare say, quite wrongly—marine underwriters like to think that fire insurance rates of premium are so standardized that to fix the rate for a particular risk is like helping yourself to a match out of a box to light your pipe, or looking at the clock. You, with your instructed knowledge, may perhaps repudiate such a view, but you will probably recognize that the business of marine insurance must needs offer an extremely wide field for the fixing of rates; and you may wonder how they are fixed at all. Well, they are fixed, after all, much as the fire insurance premiums are fixed—by statistical experience. This is how it is done:

Each day's acceptances are entered, one beneath the other, in a book: ship, voyage, nature of goods, rate and amount of premium, and so on. Then each entry is separately extracted and re-entered in the sub-division or classification of voyage to which it specially belongs. Thus the risks outward to Australia via Suez Canal will be grouped together, and similarly the risks via the Cape; two separate categories. Then these voyages homeward will be similarly grouped; two more separate categories. And so with the voyage—voyages out and voyages home—to and from almost everywhere. Ships, as distinguished from cargoes, will be treated separately, more or less; ships insured for time kept apart from those insured for a particular voyage; mail steamers distinguished from tramps; and so on and so on.

Then when claims or losses are paid, or premiums returned, they are first entered more or less together in one book and then, in their turn, they are extracted and posted each against its own policy entry, in its proper classification. So that each statistical group or classification shows in one column the premiums re-

ceived, and in a parallel column the settlements or returns of premium. At intervals the two columns are added and the totals compared; so that over a term of years it is easy to see at a glance whether the premium for this particular voyage calls for any alteration. All underwriters work more or less closely on this system, and the result of their common experience is to evolve a standard rate, which, if somewhat elastic, is still a standard rate. I may perhaps add that there exists also, among the companies at any rate, a sort of counter-attack. Each merchant's account is kept separately, premiums on one side, losses on the other; so that this method of double statistics must needs keep the premiums under close control.

AVERAGE.

A marine insurance policy "with average" has a very different meaning from a fire policy so effected. The primary marine insurance meaning of "average" is damage; partial loss; charges. Marine insurance claims are either for loss—meaning total loss—or average, meaning a loss which is not total.

Sea-water damage is known as "particular average" and marine insurance on cargo are either "free of particular average," which means that the owner of the goods runs his own risk as regards sea-damage; or "with average," which means that if the goods are sea-damaged he can recover under the policy. For a "with average" policy the premium is rather higher, varying according to the degree of susceptibility to damage. Now, it works out this way:

Say that if the goods had arrived undamaged they would have realized £100, but that, being sea-damaged, they only fetch £80. There you have a depreciation, what is called a "particular average," of 20 per cent.—an injury or "average" to the particular goods, as distinguished from injury or "average" to the combined or "general" interest. That particular average of 20 per cent. has to be applied to the insured value. It is this meaning of the word in the marine policy which, I take it, has been borrowed to describe a form of fire insurance under which the compensation to be paid is to be based on the relation which the lesser sum insured bears to the real and greater value of the property at risk.

Under the marine policy the percentage of depreciation or "average" is ascertained by comparing sound and damaged values, and the percentage thus arrived at has to be applied to the sum insured. If, in the case supposed, the goods are only insured for £80, then 20 per cent. on that will give a claim of £16 as against the loss of £20. If the actual value happens to be identical with the insured value, the claim will, of course, be £20, the amount of the actual loss. If the insured

value is £120—and it probably will be some such figure as that—then 20 per cent. applied to £120 will give an "average" or recovery of £24, or £4 more than the actual loss. So that if a large and very valuable shipment be in question and the damage be serious and the over-insurance perhaps 30 per cent. or 40 per cent., the owner of the goods will make quite a handsome profit out of it. That such a thing should be possible, I am aware, will make dead and gone fire insurance managers turn in their eminently respectable graves, but I am here to tell the truth. I should add that, over and above the percentage of his loss, applied to the sum insured, the owner of the goods is also entitled to recover extra charges arising out of the damage—the cost of special handling, of certificates of sound and damaged values, and the like. *And* the cost of what is called the "Average Adjustment."

For you must understand that, while I have illustrated my explanation by rudimentary figures, when you have a large shipment of goods of many different qualities and corresponding sound and damaged values and different degrees of damage, and perhaps, as in the case of sugar, loss of weight to be made good, or, in the case of jute or leather, increase of weight to be allowed for, elaborate and voluminous calculations are required. These are made by a firm of "Average Adjusters," who, naturally, charge a fee for their work, which is highly technical, and this fee forms an addition to the claim.

We have just seen that insurance on goods are either "with average," in which cases the underwriters run the risk of sea-damage, or Free of Particular Average—shortly known as "F. P. A."—in which the risk of sea-damage is borne by the assured. But now here comes in an interesting and important exception in the F. P. A. policy: the insurance is F. P. A. "unless the ship is stranded, sunk or burnt." There are refinements of this exception, but we can confine ourselves to the first, that of stranding, as typical of the rest. If the ship be stranded, the fact, as it is technically said, "lets in the average"—that is, it converts the policy into a "with average" insurance.

Now, first of all, what *is* a "stranding"? A stranding is a grounding as distinguished from a striking: it means such a contact with the ground, or some object fixed to the ground, as shall bring the ship to a stop. It may be only for a minute or two, but if the ship be really and unmistakably aground and held fast, she is technically stranded, even though she may become reelased in a minute or two. But the grounding, to constitute a legal stranding, must be unforeseen and accidental and out of the ordinary course of navigation. In tidal waters, for instance, at certain places, it is the usual or common thing for a ship to "sit on the ground" at low water. That is a

grounding, but not a "stranding." Now, see how it operates. Imagine an old vessel with a cargo of wheat from Australia or the Pacific. Wheat, like corn, fish, salt, fruit and seed, for example, being peculiarly damageable by sea-water, is always insured F. P. A. The ship meets with a succession of violent gales, leaks like a sieve, and is only kept afloat by her pumps. Her cargo, worth when shipped £40,000 or £50,000, is delivered more or less rotten—depreciated 50 per cent. or 80 per cent., say. The policy being F. P. A., there is no claim under it. But in coming into dock, by bad management or perhaps because the vessel is, with her sodden cargo, very deep in the water, she sticks for a minute or two on the dock sill. This is technically a "stranding," and, though it caused no damage whatever, the mere fact of the stranding converts the policy into a "with average" insurance. You have, I think, nothing so sporting as that in your fire policy.

TWO KINDS OF AVERAGE.

Then there is another thing you have not got; you have not got General Average. Particular Average is, as I have said, accidental average—damage or charges—attaching to a particular object, a particular part of the cargo; or, if an insurance of the ship be in question, accidental damage to the ship herself. General Average is loss, damage or charges, incurred by or on behalf of the whole adventure generally—ship, cargo and freight; and this loss, damage, or charges must be incurred, or inflicted, not accidentally, but intentionally, deliberately. And it must be done in a moment of emergency in order to save ship and cargo from total loss.

For example, a ship runs aground, and in order to get her off she has to be lightened by throwing cargo overboard. The loss of the cargo is General Average. Or, instead of throwing cargo overboard, the ship's engines are worked when she is aground, a use for which they were not intended. Sand gets into and damages the bearings, or the propeller is bent or broken by striking the ground. This is a voluntary sacrifice of the ship's engines for the general safety; the damage is General Average. Or a fire breaks out in the cargo, and the hold is flooded in order to save the ship and cargo, with heavy damage to cargo. This, again, is General Average. These are just simple illustrations out of many. In each case the loss or damage was voluntarily and deliberately incurred in a moment of common or general peril for the general safety. Therefore, General Average.

And, being General Average, it has to be borne generally, *pro rata*, on the value of each interest or package saved, and on the value of the ship and on the money, if any, due to her as freight. And if a ship be broken down or be picked up

derelict at sea and be brought into safety by salvors, the salvage awarded to them has, in like manner, to be apportioned over the whole; it is practically, though, I think, not technically, General Average.

VALUES OF CARGOES.

Now, before considering the apportionment and collection of this General Average, let us just leave marine insurance for a moment. I wonder if you have ever considered what is the carrying capacity of that mammoth thing, that engineering marvel—the modern steamship? If not, the time, if we glance at it, won't be wasted, even if it diverts us, or seems to divert us, from our particular—and fascinating!—subject of marine insurance.

You will know, of course, that ships are now built of 30, 40, 50 thousand tons gross measurement. These giants are, however, passenger steamers, which carry very little cargo in proportion to their size. We may have cargo ships perhaps of 20,000 tons, but 10,000 tons is common enough; so let us take a ship of about 10,000 tons gross measurement. A Board of Trade ton is 100 cubic feet capable, in rough and ready terms, of containing 2½ dead-weight tons of goods which are neither light nor heavy. A 10,000 ton ship, after allowing for engine space and so on, will carry about 16,000 tons of ordinary cargo. At any rate, we will suppose a ship carrying 16,000 tons of cargo. Now, the size of railway trucks varies, but though they are now being made bigger, let us take their average load at 8 tons. Therefore, it will take 2,000 trucks to empty the ship. A train of 30 loaded trucks is a very long one—too long if the gradients are steep; but take it at 30 trucks. And we want 2,000—66 trains of 30 trucks each. But first let us look at our 2,000 trucks in a row. The extreme length of an 8-ton goods-trucks, nose to tail, is 18 feet (6 yards). Multiply our 2,000 trucks in a row by 6, and you get 12,000 yards of trucks —7 miles of trucks, and all full of goods out of a single ship. You will remember how I remarked, at the beginning, that the fire insurance business is like a vast lake, always growing bigger and bigger, because always being filled and filled by the mighty river of ocean trade which flows into it unceasingly. This single shipload will help you to see what I mean.

GENERAL AVERAGE.

And now we can get back to General Average, and you will be, after our little digression, better able to realize what a General Average claim means in the case of a big modern ship. Seven miles—or, of course, less in the case of a smaller ship—of cargo to be valued, every separate lot of it; hundreds, possibly a thousand, different consignees. If the General Average shall

have been damage caused in extinguishing a fire, every package to be surveyed, the sound values and damaged values ascertained and certified; and, more than that, ordinary sea-damage distinguished from what we may call the firemen's damage. Bills for handling, surveying, "making merchantable" and so forth—sheaves and sheaves of them; a cartload, possibly a wagonload of documents. They all go to an Average Adjuster who sorts and classifies them and enters them into a book, carrying each item into its own column, or perhaps sub-dividing the item into several columns. I have in mind a general average which took four years to make up—"adjust" is the approved expression—at a fee of 2,000 guineas to the adjuster—very well earned—and with a cost of £380 for printing copies of the wonderful work—for every underwriter is supposed to have a copy of it in order to "examine" the claim before he pays it. The "average" is worked out to a decimal point, and every shipment contributes *pro rata* according to the value saved by the general average sacrifice or expenditure. The book or "adjustment" is sometimes nearly as big as a tomb-stone and just about as digestible.

Now, you haven't got anything like this in fire insurance—or, for your own sakes, I hope not! And the humorous thing about it is that for the most part it is entirely unnecessary. It is a survival. No doubt the very earliest form of marine insurance was an agreement or understanding that, if one man's goods were jettisoned or sacrificed, he should be compensated by a *pro rata* contribution by all the rest. Merchants travelled with their goods in those days, and Tiglath would not agree to the sacrifice of his bale of rugs, instead of Pilesah's baskets of dates, unless the owner of the ship and all the other cargo-owners agreed to stand in with his loss. Eventually came in marine insurance as a recognized system and a merchant whose goods are sacrificed, whether the policy be with average or F. P. A., is now able to go straight to his underwriter for compensation. Then, two or three years afterwards, the underwriter gets back through the shipowner the contributions of all the other co-adventurers. He gets it back, less, of course, his share of the cost of the whole solemn foolery; and I may tell you that, broadly stated, the cost of applying all this general average machinery works out at about 12 per cent. addition to the actual loss.

OBSOLETE PRACTICES.

You may ask why, then, is it done? I was reading a book on Russia the other day in which it was stated that a Russian peasant's plow is very frequently part of a tree with a short and sharpened bit of the branch projecting from it as a plowshare. Close by, a modern plow, or a steam tractor, may be in use, but

he does not care about that: "What was good enough for my father and my grandfather," he says, "is good enough for me!" And that is the only answer I can give you.

Fire insurance may have got some foolish things about it, but either for antiquity or for foolishness it does not begin to compare with marine insurance. But, after all, this is hardly fair to marine insurance. General average is an ancient law of the sea and maritime insurance has to adapt itself to facts, as it finds them. The general average system, now that we have a scientific and universal system of marine insurance is, to a very great extent, if not entirely, an obsolete nuisance to everybody except the average adjuster. It ought to be amended in its system of collection or even abolished altogether; but what is everybody's business is nobody's business. So we go on plowing with our tree-trunk. We go on with a fifth and costly wheel to the coach of commerce.

And here I close my remarks. My lecture, I know well enough, has been a lecture of omissions—like the Irishman's handkerchief, holes strung together. But in the brief space at my disposal I had to choose between giving you the webbing which connects the holes, and the countless little stitches which should fill them. I decided on the webbing. If I had filled up my allotted time with technicalities, you, if you are like your lecturer, would probably have forgotten one half and mixed the other half up with it. I have tried to give you some salient points and to do so in a way which would assist you to remember them.

THE WOODEN AUXILIARY.

The type of boat causing the underwriter greatest concern at present is the wooden auxiliary motor vessel.

A few years ago the Diesel was perfected in Scandinavia and demonstrated that an oil engine was able to take a large vessel on long voyages to the Far East and return successfully and could do this at a less cost than a vessel of similar carrying capacity driven by steam.

However these vessels were of steel and so far as the hull construction was concerned were identical with the best steel steamers and conformed with Lloyds rules for a 100-A1 rating. When they first came out underwriters had some doubts about how the engine would perform and various clauses were adopted in regard to the cover extended to machinery. Some underwriters insuring losses caused by burning, sinking, stranding and collision, some insisting on a large deductible average. At first there were many breakdowns, some due to faulty construction and some to the ignorance of the engineers. The ignition system gave the most trouble, but gradually the designers and builders overcame the defects and the operators became familiar with their engines, so that a new steel vessel equipped with Diesel engines built in Scandinavia can be readily insured.

In this country, however, a very different situation exists. On the Pacific Coast a type of wooden freight steamer known as a steam schooner has been developed. It has been evolved from the sailing schooner fitted with engines and boilers. It is not a very seaworthy boat but for handling cargoes of light lumber coastwise it has answered requirements. The steam schooner hull has been copied in designing the wooden auxiliary. For fishing boats and small schooners, an auxiliary engine has been found helpful in moving around docks, keeping the channels, and making harbors especially when there is no wind. Boats of this character have been equipped with gasoline or distillate engines, which are very different things from the Diesel or semi-Diesel type.

With the increased number of large motor ships and the small auxiliaries, owners of schooners began to think of making their vessels auxiliaries. The first attempts were not very successful. Auxiliary engines are fitted only with the idea of helping out the sails or maneuvering around docks or harbors, but the captains commenced operating them as if they were steamers, and would attempt to hold courses in heavy weather which they never

would have thought of before the engines were installed, relying on the engines to keep the ship off shore. There were times when the engine could not do it and stranding resulted. In many instances engines were not used after a few trips and sometimes they were taken out altogether. The auxiliary did not become successful. There was always the temptation to attempt to make the engine do more than it was ever designed or expected to do, but also there was no really successful engine of a suitable size. The vessels were too small for the oil engine and too large for the gasoline engine. However, the engine builders worked at the problem and now there are a few manufacturers who turn out a suitable and fairly reliable engine, but the recent demand for motors has brought on the market new makes that are not showing up well.

It has been practically impossible for some time for a private owner to place an order for a steamer in this country. The output of the steel shipyards of the country was taken over by the shipping board. New shipyards and fabricating yards have been built by them, and hulls are being constructed at such a rapid rate that the builders of the machinery, boiler, engines, turbines, reducing gears, shafting, propellers, etc., can hardly keep up with them. All that remains for the private owner is the wooden steamer, a sailing ship or an auxiliary.

The old owners have stuck to sailing vessels, and these are being built chiefly in the East. In the West they are building auxiliaries as a result of the activity of engine builders in advertising and pushing their machinery. The regular yards have been full of orders for steel vessels, and the lumber yards have begun building the wooden auxiliaries to meet the demand for more shipping. This type of boat is not satisfactory. Insufficient care has been taken both as to construction and material. The thrust-block, for example, is unreliable. This is the fitting that takes the entire strain of the vessel when the propellers begin to revolve. Another element of faulty construction is the use of spikes instead of bolts. Designs of these wooden auxiliaries were submitted to Lloyds Register and also to the American Bureau of Shipping, and these bodies have agreed to give the auxiliaries a class. This gives a wrong impression to their owners as to the merits of the vessels. Armed with this pseudo endorsement by Lloyds Register and the American Bureau, owners are pushing their ships for admission to trans-Atlantic service, A work for which they are believed by marine underwriters to be absolutely inadapted. The underwriters are "at sea" as regards these vessels, and while new comers in the marine underwriting field are accepting them the most reliable companies are declining them. Experienced underwriters prefer sailing-ships to these auxiliaries. They consider them both under-rigged and under-powered. The rigging

has been neglected with reliance placed upon the power, and the power has been insufficiently arranged for with dependence placed on the rig. Much the wiser course for the builders would have been to consult with the underwriters before going ahead with construction work. Some of these ships have cost between $300,000 and $400,000 and now the owners have them on their hands and are finding that experts consider them unfit for trans-Atlantic privileges and with insurance proportionately difficult to secure.

CONCRETE SHIPS AND YARDS.

By A. G. Monks.

Of Boston, Mass.

There is little experience yet in design of concrete ships and less in design of plants as compared with the well established building of steel or wooden ships. Changes and improvements may confidently be expected. At this date the reproduction in concrete of the framing and the form of steel ships has been wisely adopted, and has been followed by the British engineers and is advised by the joint committee of the American Concrete Institute and the Portland Cement Association and conservative naval architects and engineers.

Controversy over the merits and demerits of design of ships, concrete for use in sea water, comparative costs of maintenance, initial costs of net cargo capacities with per ton costs of transportation, ultimate length of safe service and the final place the ships may occupy in the economics of ocean transportation are not good questions for forcing upon the now heavily overloaded public's mind. They are still open questions whose existence may well stimulate the keenest rivalry for their solution by those who are chosen for that work, and as well, those who are technically capable and have not yet been delegated to some phase of the question.

The Liberty Shipbuilding Co. of Boston has one of the five agency contracts for concrete ships. These will be built at the yards at Wilmington, N. C. I desire to present briefly a description of this yard.

The fact that concrete shipbuilding is still in the pioneer state, has determined the character of construction of the yard; this will be temporary with light wooden construction. Rapid changes in yard design and equipment and larger salvage of materials of yard and equipment will be possible, more rapid prosecution of the first shipbuilding itself can take place, and less initial cost will be incurred. An example of possible change of yard design is the use of steel forms (as the art of concrete shipbuilding advances). The design of the yard will also be governed by local conditions, the site, the market for building materials, the number and size of vessels to be built and the climate.

Discussion of this yard divides itself naturally into groups; the site, water basins and shipways; the concrete department,

erecting machinery and the general storehouse; the traffic service of standard and narrow gauge railways, paved truck roads and rolling stock; the timber department of storage open and enclosed and wood working buildings and machines; steel storage and steel working buildings; the general yard service of water, fire protection, sewerage and electricity and the provisions for the main office, the yard employees and the troops to be stationed at the yard.

The site is in the city of Wilmington, N. C., on the Cape Fear River, about thirty miles from the sea. A deep channel has recently been dredged by the site to a point above the city. The top soil is marsh mud some fifteen to twenty feet deep overlying sand and gravel base. The channel dredging furnished material for hydraulic sand fill over considerable portion of the thirty-five acre site. Additional dredging between channel and site and from the launching basins will provide further fill. The site has a river frontage of 3,500 feet, about 1,400 feet of which is now being developed to a depth of 1,100 feet. Within this space provision is being made for four ways in the form of three launching basins with two piers having launching ways on both sides, parallel to the basins. The basins or docks are 460 feet long and 160 feet wide and are dredged to a depth of 20 feet at low water. The piers are 30 feet wide. Wooden piles with heavy timber capping support the ships during construction and launching. A heavy bulkhead at the pier edge retains the sand fill which forms the working deck. The pier slopes from high water level at opposite edges, at the rate of one and one-eighth inches per foot until it reaches the level of the central portion five feet above high water. The tankers are to be 420 feet long, 53 feet wide. They will be launched sidewise.

Storage of concrete materials with capacity for one ship will be on the piers between the building slips so as to serve a ship either side. The cement will be stored in bags in a wooden shed, and the sand and stone will be piled in the open.

Two single cubic yard concrete mixers, mounted on wheels, will be moved from ship to ship. When in operation, they will be placed between the materials and the ship. A spare mixer will be provided.

Two shipyard derricks located at the shipways will handle the forms; reinforcing steel, steel and iron castings, and concrete. These derricks will be of three ton capacity at 75 feet radius with towers 50 feet high. Both will be in operation in one ship during the pouring of the concrete. At other times they will be used among the ships under construction as required. These derricks travel on rails 24 feet apart and have a wheel base of 24 feet. They can be moved from ship to ship by means of a transfer car running along the head of the docks.

This car will be made strong enough to enable the derricks to be used while on the transfer car in unloading materials from lighters in the docks.

A general storehouse will be provided at the head of the basin between two piers, thus serving four ships. This will be an enclosed wooden building to house general supplies, rigging, tools and spare parts for the yard machinery.

The main line of the railroad enters the yard at the rear of one end and runs parallel with the river throughout the extent of the present development and can be extended if the yard is enlarged. From the main line spur tracks are run to the lumber storage and to the piers. One spur track runs through the steel storage and bending space, another runs in front of the general storehouse and along the form storage; other spurs serve the mould loft and carpenter shop. Thus every process in the yard is thoroughly served with Standard Gauge railroad, except that the railroad used to take lumber from the storage piles to the saw mill and the carpenter shop is narrow gauge. Paved roads parallel the railroad everywhere and thus when cars or railroad may not be available, automobile trucks will be used instead.

The yard will be provided with a small number of standard gauge railroad cars and a locomotive. A larger number of narrow gauge cars will be provided for handling lumber. The number of automobile trucks which will be required to supplement railroad transportation has not yet been determined. Rough lumber storage is beside the yard's service railroad and is in the open except as experience may call for roof over portions; adjoining is the sawmill for cutting to required sizes and for dressings; then lumber is taken to finished lumber storage with finished lumber purchased directly.

The mold loft is one story, 90 feet by 260 feet; the central bay 60 by 60 feet clear of posts; flooring of white pine carefully levelled constitutes a full size drawing board on which the ship's lines are laid out and from these the molds or templates are made.

The carpenter shop is one story, wooden, 60 by 200 feet, with an ell 60 by 80 feet near one end in which wood working machinery is located. At the other end of the shop is a high portion in which bow and stern forms are built to full height. The machinery ell has enclosing side walls. This shop is located near the mold loft, from which come the molds according to which the forms are built.

The oil process building will house oil dipping tanks and drain racks. The lumber for the facing of the molds will be the best seasoned stock obtainable. It will be shipped to us in closed cars, then dipped in linseed oil, then as assembled all joints are to be painted. The finished sections of flat forms

will be dipped and the surface that has contact with the concrete will receive a final coat of paint.

Form storage buildings are to be merely shelter roofs and will be located close by the building ways. They will have enough space for the storage of forms for four ships. The flat pieces and panels will be piled up but the large built up forms for the curved surfaces cannot be piled.

Reinforcing steel will be taken off of the cars and placed in storage racks and will be sorted to size. Space will be provided for four thousand tons. About twelve hundred tons are required for each ship.

Cutting shears and bending tables will be under a shelter roof; cut and bent steel will be taken on standard gauge cars and stored in the open alongside the railroad tracks (at convenient places).

Water service, for manufacturing, drinking and sanitary purposes will be provided from the city supply. The city will bring this to the yard in a six-inch main and the shipbuilding company will provide its own distributing system.

Water for fire protection will be pumped from the river probably into an elevated tank to supply the automatic sprinklers and yard hydrants. It is expected that all buildings will be protected by automatic sprinklers, well placed hydrants and hose houses.

A city sewer now runs through the site and empties into the river. All sewerage and drainage of the yard will connect with this sewer or will empty directly into the river.

Electricity both for power and lighting will be purchased from the local public service company who will completely install it.

An additional "break-down" power station having capacity enough to light the yard (in case of a breakdown during the concreting of a ship) will be provided. The concrete is to be poured continuously from start to finish to avoid construction joints and laitance. It is expected that the pouring of one ship will take three or four days' continuous work. The lighting service covers the entire yard, the buildings and the protective fence about the yard.

Electric power will be used for the woodworking machines and for the steel bending machines. The mixers and derricks have their own steam power.

The gate house, employment office and first aid room are of more or less standard arrangement. The gate house is designed to pass two thousand men. The restaurant is to be two-story, wooden, fully supplied with screens, with kitchen on first floor and seats for two hundred and fifty men—provision has been made to double the capacity, if desired. Service will be cafeteria, each customer taking a tray, passing the service counter, then the cashier's desk, before eating. The second floor has a lunch

room for the office force and a conference lunch room for department heads.

For the troops to be stationed at the yard, barracks with the requisite number of additional buildings, officers' quarters, cook house, mess houses, etc., will be built. The presence of uniformed soldiers at the shipbuilding yard has been found to be important and beneficial, not only for the protection of the yard from marauders, but as a constant reminder to the men of the cause for which the shipbuilding work is being carried on.

The office building is two story wooden, for the executive and clerical force of the Liberty Shipbuilding Co., its engineers and superintendent and the Government engineer and auditor.

It was noted earlier that the ships are to be launched sidewise; one of the interesting features discussed between the Emergency Fleet Corporation and ourselves is the construction of the ways for side-on launching. It has been determined that this is preferable to end-on for several reasons, among them being that side-on can be used on narrow channels, and that a ship may be built on a level keel with greater ease in assembling forms, placing of steel, pouring of concrete and generally in the construction.

In end-on launching the stern of the ship entering the water first floats before the bow clears the ways. The ship is thus suspended by the bow and stern, and severe stresses are induced. The stresses of side-on launching are very much less severe. Again, a steel ship hull has attained its total strength at launching, but the concrete hull needs a longer period to reach its maximum strength. Side-on launching has been used considerably on the Great Lakes and in other places, and is used on the Clyde for steel vessels due to the narrow channel.

The disadvantages of side-on launching which some regard as sufficient reason for preferring end-on, are that it is more difficult to reach the out-board side of the ship and to work there and enclosing structures to provide protection from the weather and supports for overhead travelling cranes is a great deal more expensive and the whole of one side has to be built removable, while in the case of end-on launching the doorway is much smaller.

Roofing over the ship during construction is necessary in the south on account of frequent showers, often followed by strong sunlight. This is particularly important during the process of concreting.

The mold loft is nearly completed, and we hope within ten days to be laying out the lines of the first 3,500-ton vessel.

A word on concrete shipbuilding elsewhere may fit properly in this paper.

Britain has six 1,150 tons deadweight capacity vessels building at Barrow in Furness, their design following the steel framing.

Spain is now building at Barcelona 40,000 tons in 300, 500 and 1,000-ton sizes.

Norway continues to build lighters, sea tugs and small vessels by the Fougner-Ferro Concrete Shipbuilding Co., who have established also in New York and are building a 3000 ton vessel under U. S. Government contract at Flushing, L. I.

The total tonnage of concrete ships now being built or just contracted for is about 350,000 tons. This merely equals the world's total loss for May. The loss by submarine and all other marine risks is given at 355,694. This comparison shows what a large factor the concrete ship has at once become.

The U. S. Shipping Board has decided on the complete tryout of concrete ships; has put the task up to the engineers and the builders; it is now ours to undertake it. It is now no longer a question of whether concrete ships can be made or whether they will ever replace steel and wooden ships; the vital question is to increase our total tonnage. We may depend on this being the basis of judgment of the Shipping Board when they adopted the program.

The world's tonnage needed is in large figures. Mr. Hurley has publicly stated that America's share may be to provide twenty-five million (25,000,000) tons by 1920. The net minimum tonnage to maintain an American soldier in Europe is given as five tons; apply this to 5,000,000 men, which our Overseas Army may reach, and the 25,000,000 tons which Mr. Hurley names is all absorbed to care for them; that would be almost literally General Pershing's bridge of ships. Mr. Hurley said at the annual dinner of the National Marine League in New York last March:

"It took Germany forty years to build up her mighty war machine. In less than eight months we have built up a ship-building machine which. when it gets into full swing, will defeat the military machine of Germany."

John Barrett, director of the Pan-American Bureau, places shipping, American built, owned and operated shipping, as the one great factor to give America the power to extend to all the needy portions of the world benefits like unto living in America.

General Black, addressing the Electrical Engineers recently, outlined the extent to which modern war is an engineering problem and revealed for the first time the war-time organization of the Engineering Corps, with its 8,000 officers and 200,000 enlisted men.

The building of concrete ships is one of those engineering problems which have been forced to the forefront as war measures. I believe confidently that the engineers of the United States will solve this problem for the U. S. Shipping Board.

MARINE COVERAGE BROAD.

By Joseph A. O'Brien.

Member of the Association of Average Adjusters of the United States.

The development of marine insurance is such that at this time practically every contingency of loss can be protected.

Under the ordinary marine policy the protection is within certain restrictions, but, by agreement and payment of additional premium, the protection can be broadened.

The ordinary perils protected by a marine policy are embraced in the following clause in the policy:

"Touching the adventures and perils which the said assurers are contented to bear, and take upon themselves, they are of the seas, men-of-war, fires, enemies, pirates, rovers, thieves, jettisons, letters of mart and countermart, reprisals,, takings at sea, arrests, restraints and detainments of all kings, princes or people of what nation, condition or quality soever, barratry of the master and mariners, and all other perils, losses and misfortunes that have or shall come to the hurt, detriment or damage of the subject insured."

This cover in its terms is very broad, but its legal bearings have been defined by the courts. The cover is further modified by the following warranty which appears in the policy:

"Warranted by the assured free from claim on account of capture, seizure, detention or destruction, by or arising from any belligerent nation, or by or from any officer, civil or military, or other person claiming to act in their name or under their authority, or in their behalf."

The term "thieves" has been defined by the courts as meaning "assailing thieves" (i.e., pirates, etc.), consequently this term does not protect against theft and pilferage.

The term "all other perils, losses and misfortunes" has been defined by the courts as meaning "perils, losses, etc.," of like nature to those already mentioned in the first part of the clause.

The protection under an ordinary marine policy is therefore confined to losses caused by sinking, stranding, collision, fire, stress of weather, barratry and piracy. Protection from loss by causes beyond these limits is only by special agreement endorsed on the policy.

War risk is not covered by an ordinary marine policy, but can

be covered by deleting the "free from capture" clause in the policy or by the issuance of a special war risk policy.

Marine insurance is effected either for the voyage or for a term. Marine policies are "valued policies"—i.e., the value of the property insured, either vessel or cargo, is the value named in the policy, and is the basis for all settlements under the policy.

Losses are classified under three heads, viz., total loss, particular average, general average.

Total loss is the absolute loss of the vessel and her cargo, such as foundering at sea, total destruction by fire or by any other disaster that absolutely and completely destroys the vessel and her cargo. (Constructive total loss of the vessel is treated hereafter under the caption of "Vessel.")

Particular average is loss and/or damage to the property insured, either vessel or cargo, occasioned or caused by perils insured against.

General average is the necessary expense or sacrifice at a time of peril made for the benefit of all interests and to which expense or sacrifice all interests contribute. (See further remarks under caption "General Average.")

VESSEL.

In insuring a vessel the valuation thereof is agreed in the policy, which, for all purposes of the insurance, is the value of the ship. Whatever sum the underwriter insures will pay such proportion of loss as that sum bears to the valuation named in the policy.

The ordinary ocean vessel form of policy issued by American underwriters protects the contingencies named in the third paragraph of this treatise, but provides that claims for particular average must amount to 5 per cent. of the valuation before constituting a claim under the policy. This feature is frequently modified by special agreement endorsed on the policy for which an additional premium is usually charged.

Insurance on vessel can be effected against the risk of "total loss only"; or "free of particular average"; or under special conditions of average. All these different forms and conditions are a matter of rate of premium.

A policy written "free of particular average" would not protect the owner for any damage to the vessel—it would only pay total loss and general average.

A policy written against "total loss and or constructive total loss" pays only in the event of such contingencies. It is pertinent at this point to define "constructive total loss." Under English law where a vessel is reasonably abandoned on account of its total loss appearing unavoidable, or because it could not be preserved from actual total loss without an expenditure which would exceed its value when the expenditure

had been incurred, or where the vessel is so damaged from a peril insured against that the cost of repairing the damage would exceed the value of the ship when repaired, there is a constructive total loss.

Under American law (but subject to any express conditions in the policy) a constructive total loss can be claimed where the cost of repairs exceeds 50 per cent. of the valuation named in the policy.

It has become customary for American policies to contain a clause bearing upon constructive total loss which brings the conditions nearer to the English law. This clause usually reads as follows:

"No recovery for a constructive total loss shall be had hereunder unless the expense of recovering and repairing the vessel shall exceed the insured value."

Under American policies (unless special conditions are endorsed thereon) there is deducted from all damage repair bills "one-third-new for old." These conditions are frequently modified in the case of iron and steel vessels and upon inland craft, but all wooden ocean hulls are generally subject to this condition.

On inland craft it is usual to substitute what is known as a "deductible average," which is generally made to apply to both particular average and general average and provides that the underwriters shall pay only the excess of the deductible average. This average is usually about 1 per cent. of the valuation named in the policy on vessels valued over $10,000.00 and a flat deductible average of $100.00 on valuations below $10,000.00.

Pleasure yachts are usually covered under a very full and liberal form of policy and without deductions.

It is customary to introduce in a marine policy on a steam vessel what is known as the negligence or "Inchmaree" clause. The clause usually reads as follows:

"This insurance also specially to cover (subject to the average warranty) loss of, or damage to hull or machinery, through the negligence of master, mariners, engineers, or pilots, or through explosions, bursting of boilers, breakage of shafts, or through any latent defect in the machinery or hull, provided such loss or damage has not resulted from want of due diligence by the owners of the ship, or any of them, or by the manager."

Collision liability is not covered under a marine policy, except by special agreement, and a rider to that effect is then attached to the policy which protects the owner of the vessel for any liability that may rest on the insured vessel for loss or damage to any other vessel, her freight or cargo resulting from collision. The collision rider does not protect the liability for loss of life or personal injury.

The vessel owner can also obtain a form of insurance known as "protection and indemnity insurance." This protects the liability of the shipowner in the event of claim for loss of life, personal injury, damage to docks, wharves or fixed structures, removal of obstructions under statutory requirements, loss of and damage to cargo for which the vessel may be liable as a common carrier, also claims of the crew for death, injury, sickness, etc.

In the event of disaster the policy of insurance specially provides that it shall be lawful for the assured, their factors, servants, and assigns to sue, labor and travel for, in, and about the defense, safeguard, and recovery of the said ship, etc., or any part thereof, without prejudice to the insurance, to the charges whereof the underwriter will contribute in proportion to the insured interest. The policy also provides that no act of the insurer or insured in recovering, saving, or preserving the property insured shall be considered as a waiver or acceptance of abandonment.

When a vessel has incurred general average by the commission of a general average act, the master, when the vessel arrives at port of destination, immediately places the matter in the hands of qualified average adjusters to bond the cargo and obtain security before any of the cargo is delivered. On voyages to foreign ports the masters usually have instructions, from the owners or managers of the vessel, as to whom they shall report in the event of incurring general average. On the coast the coastwise steamship companies have some well-known firm of average adjusters to whom they entrust every case of general average occurring anywhere on their lines. Many masters of foreign tramp vessels have permanent instructions respecting this feature. The master also appears before the proper government authority and notes a marine protest which recites the circumstances of the disaster and is sworn to by the master and two or three of the ship's officers or crew. A certified copy of this document constitutes the "proof of the disaster."

In the United States these protests are usually made before a marine notary.

If the vessel has suffered damage the master calls for a Board of Survey. If he is in a foreign port, he usually calls in one of Lloyd's surveyors. A survey report is made, specifications for repairs drawn and the ship repaired in acordance therewith. The bills for the repairs. approved by the surveyors, are the basis for settlement of claim for particular average with the underwriters.

If the vessel is in a home port, or within reasonable reach thereof, it is customary to notify the underwriter, who will send

an underwriters' surveyor to go into the matter of survey and repairs.

In the case of inland vessels notice should always be given the underwriter immediately after the disaster.

A certified copy of the master's protest, the original surveyor's report and specifications for repairs, together with the receipted bills for the repairs approved by the surveyors constitute the necessary documents to support claim for particular average.

In event of claim for total loss the following documents are necessary:

Certified copy of master's protest.

Custom house certificate of ownership.

An affidavit by the claimant, certifying the facts, particularly with respect to the amount of insurance on the vessel at the time of the loss.

The policy of insurance.

MARINE HULL INSURANCE.

By Benjamin Rush.

President of the Insurance Co. of North America.

It will clarify the remarks, which I am about to make, which on account of the limited time at my disposal must necessarily be brief, if I recite certain peculiar unwritten understandings which, although they do not appear anywhere on the face of a marine policy, are, nevertheless, well known and thoroughly understood in the mercantile business, and are enforced by the courts. The first is that the insurance contract being a contract of good faith will fall to the ground, in whole or in part, in the event of fraudulent practices by either party to the contract, therefore it is an implied condition in every contract of marine insurance that the person who proposes the risk to an underwriter shall communicate every material fact, which is within his exclusive knowledge, to that underwriter, unless the terms of the policy are such as to render such communication superfluous.

He must tell everything he knows which he thinks might influence the underwriter's judgment, either to accept or decline the risk, or even to increase or diminish the premium charges; furthermore, he must not conceal anything which might induce the underwriter to decline the risk, or which, were it known, might influence the underwriter's judgment in any of the above particulars, and it makes no difference whether this concealment results from ignorance or design, it will be equally fatal to the contract.

IMPLIED WARRANTIES.

Another understood necessity of the contract of insurance is that the insured shall have an interest in the subject at risk; he cannot simply bet or wager on the safe arrival of this or that ship if he has no interest in her. Wager policies, as they are called, have long since been pronounced illegal, and they cannot now be enforced in any court in this country or in England.

Another implied warranty, as it is called, is that every vessel shall be seaworthy, and that she shall pursue her voyage without any undue delay or deviation from any of the established usages of trade or navigation; and finally that the adventure must be a legal one both as regards its business nature and the mode in which it is prosecuted. A great many cases have come before the courts, and a great many books have been written to

define just what constitutes seaworthiness; a brief definition is thorough fitness in all respects of the vessel named to pursue her voyage to its destination, and to encounter the ordinary perils, which must be met with in so doing. Neither the ignorance nor innocence of the assured will avail to relieve him from a breach of this warranty.

As regards voyage insurance on hull, it is to be noted that the warranty of seaworthiness, may be subdivided, thus the degree of seaworthiness required of a vessel lying safe in port is less than would be necessary for navigating the ocean. As regards the hull underwriting, the warranty of seaworthiness is satisfied if a vessel is seaworthy for that portion of the voyage which she is about to undertake. While lying in port she must be seaworthy for the risks of the port, and be in condition to move to and fro in that port for the purpose of outfitting or loading cargo. When she leaves such port a higher degree of seaworthiness attaches. If the voyage contemplates a river or lake transit prior to reaching the ocean, she must be sufficiently seaworthy to encounter the ordinary risks of such river or inland body of water, and when she finally goes to sea, she must be fully seaworthy in every respect to encounter the ordinary risks and perils of the sea.

As regards a time policy on hull, it is an old axiom that there is no warranty of seaworthiness in a time policy. This is because in a time policy a vessel is or may be out of the control of the owner at the time the policy may attach, and the owner may be, and frequently is, in entire ignorance of her physical condition at that time. The only exception to the rule is that unseaworthiness known to the owner, and allowed to continue by him after he has an opportunity to remedy it, will void the policy.

It should also be remembered that the very essence of the contract of marine insurance is indemnity. Its sole and exclusive object is to procure for the assured indemnity in the strictest sense of that word, and consequently its whole spirit would be violated if the assured were to make the occurrence of any casualty insured against a means of gain, for this would be to give him an interest in procuring sea losses, which would be opposed to every principle of commercial policy.

To consider the elements of the contract, marine insurance may briefly be said to be a contract whereby one party for a specified consideration agrees to indemnify another, who is interested in property exposed to marine risk, against loss incidental thereto.

DEVIATION.

If the ship, without entirely abandoning the prosecution of the voyage described in the policy, yet voluntarily and without justifying cause departs from the prescribed course of that voyage, this is called a deviation, and the underwriter is not

liable for any loss occurring after the point at which the ship first quits the prescribed course. If the ship originally sails on a different voyage from that described in the policy, the latter never attaches. If, although she sails on the voyage insured she afterward entirely abandons all intention of prosecuting the voyage described in the policy, this is an abandonment or change of voyage, which voids the policy from the moment the intention of so abandoning it is definitely formed, though in the United States courts the policy is not avoided until the vessel actually deviates. These two violations of the contract of insurance are named respectively "deviation" and "change of voyage."

During the course of my preceding remarks you have no doubt noticed the words "general average," and it is pertinent at this point to explain the meaning of this term. The law of general average is one of the most ancient in the world, being established long before the Christian era, and the original germ is embodied in the law of the Island of Rhodes, providing that that which was sacrificed for the benefit of all in a sea adventure should be made good by the contribution of all. It is a law peculiar to the sea—nothing whatever of the kind is known on land. Its foundation may be said to be bedded in equity, rather than in statute. Three things are requisite and necessary in order to constitute a clear case of general average:

First: An imminent and overwhelming peril common to all interests in the adventure—ship, cargo and freight.

Second: A voluntary sacrifice made of some part of the adventure, whether ship, cargo or freight, or an expense incurred for the purpose of avoiding this imminent and otherwise unavoidable peril.

Third: The sacrifice so made must achieve the desired result of safety, at least in part.

The simplest, oldest and clearest case of general average is that of jettison of merchandise to lighten a ship in danger of being overcome by the violence of the tempest. From this foundation, the general average act has been extended to include every voluntary act or sacrifice made by the master or other accredited agent of the ship owner for the purpose of saving the adventure in whole or in part from an imminent and deadly peril. Such acts occur when cargo is jettisoned or when masts or spars are cut away in order to relieve the ship from the violence of the tempest. They also occur when a vessel is voluntarily run ashore in order to avoid the peril of sinking in deep water, or when water is poured into the hold to extinguish a fire, or when steam is injected into the hold for the same purpose.

Furthermore, the consequences of a general average act are

considered the same as the act itself, such, for instance, if the hatches are opened for the purpose of jettisoning cargo and water finds its way through the hatch and damages other cargo which was not intended to be jettisoned—the loss on such cargo would also be a general average loss. The underlying principle of general average is that all who are interested in the adventure should contribute to make good for the loss of one whose property has been sacrificed for the common welfare. Therefore, a general average act having been performed, and a general average loss having been sustained thereby, when the vessel arrives at her port of destination a general average adjustment is made up which distributes that loss equally among every interest in the adventure, and it is the duty of the underwriter to take upon his shoulders the general average contribution which is legally enforced by the lien in rem on the property itself.

PARTICULAR AVERAGE.

A particular average loss in contradistinction is a partial loss sustained by the particular subject-matter insured and caused by the perils insured against. Expenses incurred by or on behalf of the assured for the safety or preservation of the subject-matter insured other than general average and salvage charges, are called particular charges. Particular charges are not included in general average. In ordinary cases a vessel which has been damaged is repaired by her owner. A vessel is generally intended to navigate, and a damaged vessel is unfit for navigation. The usual measure of the damage sustained by the ship owner is the cost of repairing minus the improvement resulting therefrom. The general rules, relating to the adjustment of particular average, are as follows:

Where a ship has been repaired, the assured is entitled to the reasonable cost of the repairs, less the customary deductions, but not exceeding the sum insured in respect of any one casualty.

Where the ship has been only partially repaired, the assured is entitled to the reasonable cost of such repairs, computed as above, and also to be indemnified for the reasonable depreciation, if any, arising from the unrepaired damage, provided that the aggregate amount shall not exceed the cost of repairing the whole damage computed as above.

Where the ship has not been repaired, and has not been sold in her damaged state during the risk, the assured is entitled to be indemnified for the reasonable depreciation arising from the unrepaired damage, but not exceeding the reasonable cost of repairing such damage computed as above.

In an unvalued policy on hull the underwriter would pay the same aliquot part of the sum he has agreed to insure as the

damage or the expense of repairing it is of the ship's value at the commencement of the risk. In a valued policy he pays the same proportion of the cost of repair as his subscription bears to the valuation in the policy. If the damage to the ship has not been repaired, the only mode of ascertaining its amount is by the aid of surveyors or other experts.

ESTIMATING REPAIRS.

Where, however, the damage has been repaired, the established mode of estimating its amount is to deduct one-third from the whole expenses both of labor and materials, which the repairs have cost, and then assess the damage at the remaining two-thirds. This is termed deducting one-third new for old, and is done on the principle that unless a ship is quite new the substitution of new for old material is a benefit to the ship owner, who gets the ship the better for the repairs by the substitution of new work for old. While this is the legal rule, it is one which was formulated at the time when wooden ships were in general use. For such vessels the rule would undoubtedly apply, but it is very questionable whether it is a just and equitable one when applied to vessels of steel or iron construction. Consequently the Association of Average Adjusters have formulated modifications of this rule as applicable to iron ships. In brief, this ranges from no deduction whatsoever on the iron work of the ship itself down to the deduction of one-third on certain portions of her fittings.

In most hull policies the following clause is now inserted, namely, that in the event of claim no one-third new for old to be deducted from the cost of iron work repaired of hull, masts or spars. Sometimes the following clause is inserted:

"Average payable without deduction of thirds new for old whether the average be particular or general."

The effect of the latter clause is that no deduction whatsoever is made on account of age or wear and tear. Old materials should be sold and credited against the bill for the cost of the new repairs. As to successive losses happening under the currency of the same policy, during one voyage, the law provides that the insurer is liable for successive losses even though the total amount of such losses may exceed the sum insured, except that where under the same policy a partial loss which has not been repaired or otherwise made good is followed by a total loss, the assured can only recover in respect to the total loss.

If the assured, after sustaining an average loss, sell his vessel unrepaired, he is nevertheless entitled to recover for the partial loss, on the ground that the damage sustained is a continuing prejudice, for the ship's value must have been lessened by it. Therefore, the amount of the loss must be calculated as though the ship had been actually repaired.

There remains to be considered the question of actual or absolute total loss and, or, constructive total loss. A total loss as defined in insurance law is one on account of which the assured is entitled to recover from the underwriter the whole amount of the subscription. In the case of actual or absolute total loss, no notice of abandonment need be given, as the insured is entitled to claim from his underwriter the whole amount of his subscription without giving such notice. A constructive total loss is one which entitles the assured to make such a claim on condition of giving such notice. If he fails to do so, the loss can only be treated as a partial loss.

TOTAL LOSSES.

An actual or absolute total loss has been defined by Lord Abinger as follows: "If in the progress of the voyage the thing insured becomes totally destroyed or annihilated, or if it be placed by the perils insured against in such a position that it is totally out of the power of the assured, or of the underwriter, to procure its arrival, the latter is bound by the very letter of his contract to pay the sum insured."

The great principle, therefore, on which all the cases of total loss depends appears to be this—the impossibility owing to the perils insured against, of ever procuring the arrival of the thing insured. If by reason of those perils the assured is permanently and irretrievably deprived not only of all present possession and control over it, but of all reasonable hope or possibility of ever ultimately recovering possession of, or further prosecuting the adventure upon it, that is a case of absolute total loss, independently of the election of the assured to treat it as such. Notice of abandonment would, in such cases, be a mere idle formality, because nothing remains to be abandoned.

In such cases, therefore, no notice of abandonment need be given, but if any remains of the wrecked ship ultimately come to hand, or if any money has been realized by its justifiable sale, the net proceeds of such sale are considered as a salvage to which the underwriters are entitled after payment of a total loss A vessel is considered to be totally destroyed if she be, by the perils insured against, reduced to a complete state of dismemberment, so as to have lost her characteristic form, even though her hull may still hold together as a wreck.

It is to be noted that the sale of the vessel can never convert a constructive total loss into an absolute total loss. A constructive total loss is one which entitles the owner to make a claim on his underwriters upon condition of giving a notice of abandonment. The assured is entitled to give such notice where the subject-matter insured is reasonably abandoned on account of its actual total loss appearing to be unavoidable or because it could not be preserved from actual total loss without

an expenditure which would exceed its value when the expenditure had been incurred. In particular there is a constructive total loss:

First: Where the assured is deprived of the possession of his ship by the peril insured against, and (a) it is unlikely that he can ever recover the ship, or (b) the cost of recovering the ship would exceed the value when recovered, or (c) where she is so damaged by a peril insured against that the cost of repairing her would exceed the value of the ship when repaired. In estimating the cost of repairs no deduction is to be made in respect to general average contributions to those repairs payable by other interests, but account is to be taken of the expense of future salvage operations, and of any future general average contributions to which the assured would be liable if repaired.

NOTICE OF ABANDONMENT.

This is the English law. It has been held in the United States that the assured is entitled to give notice of abandonment upon his underwriter when the cost of the repairs would exceed 50 per cent. of the value of the ship. Where there is a constructive total loss, the assured may either treat the loss as a partial loss or abandon the subject insured to the insurer, and treat the loss as if it were an actual total loss. Where the assured elects to abandon the subject-matter insured to the insurer, he must give notice of abandonment. If he fails to do so the loss can only be treated as a partial loss. Notice of abandonment may be given in writing or by word of mouth, or partly in writing and partly by word of mouth, and may be given in any terms which indicate the intention of the assured to abandon his insured interest in the subject-matter insured unconditionally to the insurer. Notice of abandonment must be given with reasonable diligence after the receipt of reliable information of the loss, but where the information is of doubtful character, the assured is entitled to a reasonable time to make inquiry.

Where notice of abandonment is properly given, the rights of the assured are not prejudiced by the fact that the insurer refuses to accept the abandonment. The acceptance of an abandonment may be either expressed or implied from the conduct of the insurer. The mere silence of the insurer after notice is not an acceptance.

Where notice of abandonment is accepted the abandonment is irrevocable. The acceptance of the notice conclusively admits liability for the loss and the sufficiency of the notice. Notice of abandonment is unnecessary where, at the time when the assured receives information of the loss, there would be no possibility of benefit to the insurer if notice were given to him.

The facts as they exist at the time a notice of abandonment is given must be such as to justify it; but if they be so then the rule is that an abandonment once rightfully made is conclusive between the parties, and the rights flowing from it become vested rights, and are not to be divested by any subsequent events.

The best general statement of the circumstances which confer on the ship owner a prima facie right to give notice of abandonment is contained in the following passage from the judgment of Story, J., in the case of Peele vs. The Merchants Insurance Company. The right to abandon has been admitted to exist where there is a forcible dispossession or ouster of the owners of the ship as in case of capture, where there is a restraint or detention which deprives the owner of the free use of his ship as in cases of embargoes, blockades and arrests; where there is a total loss of the physical possession and use of the ship as in cases of submersion; where there is a total loss of the ship for the voyage, as in cases of shipwreck, so that the ship cannot be repaired in the port where the disaster happens; where the injury is so extensive that by reason of it the ship is useless, and the making repairs will exceed her value.

FIRE RISKS ON VESSELS.

By Samuel D. McComb.

of S. D. McComb & Co., New York.

At this time, when the resources of the country are being used to their fullest extent to turn out tonnage, it is essential that the greatest care should be taken to preserve the ships that are already built. There have been a number of total losses by fire on ships this year, which were of a preventable nature. Few people realize the extent of the damage done by fire to shipping annually. There are no statistics published showing the monetary loss and only incomplete reports by the government and by different classification societies showing the number of vessels and tonnage which have been total losses. So far as the fire losses are concerned, with a little precaution most of them could have been avoided.

The ideal condition would be to have a vessel constructed entirely of incombustible material and carry only incombustible cargo, but while this, of course, is impossible, the condition can be reached very closely as far as the vessel itself is concerned. The subject of fireproof material has received much consideration, but has not been used to any great extent. Sheet metal and asbestos preparations are replacing wood for interior work, but we are still using wood and other inflammable materials in the construction of our ships, and a large number of all wood ships are now being built in all parts of the country. They should be constructed so that the probability of their catching fire is reduced to a minimum, and means should be furnished for promptly extinguishing one if it occurred. From the standpoint of fire hazard, vessels can be divided into three general classes, namely, steam, gasoline, and those with no power. The classes will be taken up separately, as the principal causes of fire and the methods of extinguishing them are different in each case.

On steam vessels, the principal ascertained causes of fire are woodwork around uptake or stack igniting, spontaneous combustion of coal, fire originating in the cargo and from galley stoves, lamps and candles. Knowing how fires originate, we know the points which must be safeguarded to prevent them. It is of the utmost importance where a stack passes through a wooden deck that the opening be cut at least twelve inches clear all around and the wood be faced with asbestos and sheet iron or steel. If forced draft is used and overheats the uptake

and stack, further protection is needed—either the uptake and the base of the stack should be covered with cement or all the woodwork within a distance of three feet should be covered with sheet-iron placed over asbestos. When covering a boiler care should be taken along the sides of it; frequently the space between the boiler shell and bunkers is so small that it is difficult to make a good job, but in no case should this space be packed up with non-conducting material; some opening should always be left between the covering and the bunkers. On a leg boiler, the covering on the sides of the fire-box should be carried right down to the floor; frequently it is stopped about the level of the grate bars, and an examination will show that the heat from the uncovered plates has charred the bunker boards alongside. A coaming should be placed at the front of boilers extending across the fire-room to prevent hot ashes getting between boiler and bunker sides. If the fire-room floor is laid on a wooden deck or wooden beams, asbestos should be put down first. Hot ashes have set fire to a wooden deck through four inches of cement. The same care that is used in protecting woodwork around the boilers should be used around the galley stove and stove-pipes. All wooden partitions in the back and at the sides of all galley stoves should be protected. Where possible the floor should be brick or cement, but, if wood should be covered with sheet metal over asbestos extending out in front at least 2 feet 6 inches and the stove should be securely fastened down. Most important of all is to have a metal hood over the stove or have the ceiling overhead covered with heavy asbestos, disastrous fires having been started by grease boiling over on the stove and blazing up, setting the woodwork overhead on fire. The stack from the stove should lead outdoors by the most direct route possible; on some old passenger steamers it has many turns and bends before it finally comes through the upper deck. When possible the galley should be on the upper deck, but if placed in the hold care should be taken to run the stove pipe in such a manner that even though it get red hot it will not ignite the woodwork. In engine-rooms the method of carrying lubricating oils and waste needs attention. It is well to have the supply of oil as small as possible; where there is a large quantity on board the engineers are usually careless and extravagant with it, while, with a small supply, good care is taken to see that none is wasted. This not only saves money for the owners, but less oil is spilled about. All oil-cans should be carried in metal trays to catch the drip and all wooden shelves on which oil is kept should be completely covered with metal having the edge turned up, and all joints soldered. Large oil-cans should have self-closing faucets. No oil should be kept in partially filled barrels; when a barrel is opened, it should be emptied at once.

Metal receptacles with rolled joints should be provided for carrying waste. It is quite common to carry waste in burlap bags, placed frequently near the oil supply, so that it gets saturated with leaking oil. It appears difficult to impress on engineers the danger from spontaneous combustion from oily waste, though fierce fires are caused by it.

Lamps have been a fruitful cause of fire on ship-board. Glass lamps frequently break or crack, and should never be used. All lamps should have metal bodies and they should be secured in their sockets with clips or some device which will prevent their coming out when the vessel rolls. They should be carried in substantial wall brackets, or suspended from the ceiling, and be well stayed to prevent swaying. It is a custom on many vessels to use common table lamps, which are very easily upset by the vessel striking something or rolling heavily, and their use should be prohibited. A steam lighter on Long Island Sound collided with a sailing vessel; the shock upset a table lamp in the house aft. All the crew rushed to the bow to see what damage had been done, and the fire started by the overturned lamp was not noticed until it had gained great headway. The crew were compelled to abandon the vessel, which was totally destroyed. Lamps should always have proper shields to protect the woodwork over them. It is common to see the paint over a lamp scorched and blistered. One may be left burning when no person is around, and a fire start and get beyond control before it is noticed. Owners should impress on their masters the necessity of taking care of lamps properly. Lamp rooms are required by law to be lined with sheet metal, and in addition to this they should be made absolutely oil-tight on the bottom, and for at least a foot up on the sides; all laps and all nail holes being soldered over, and any openings in the floor for pipes or rods should have a collar or flange round them to prevent leakage of oil.

In the lamp room of a large steamer a 3-inch hole was punched in the floor for the steam extinguisher pipe. An oil barrel in the room sprung a leak, and the oil ran through the opening and spoiled a quantity of wheat in the hold. Had this oil ignited it is improbable that the vessel could have been saved. When electric lights are used the installation of the wiring and fixtures should receive careful attention. Of necessity the wire runs in many inaccessible places and a fire caused by defective wiring may be difficult to locate. All wires in the hold, in engine and boiler spaces, where cargo is carried on main deck and outdoors should be in iron conduit; switchboards should be of slate or other non-inflammable material and well clear of the woodwork back of them, and if the bulkhead is wood it should be covered with heavy asbestos or a steel plate or both. The writer has seen on a large passenger steamer a yellow pine switchboard

placed against a yellow pine bulkhead; needless to say it started a fire. It is probably impossible to prevent the use of torches in the engine and boiler rooms, but the man in charge should be cautioned to see that they are carefully used and not left about when lighted. Fires from this cause are numerous—in one instance a lighted torch was left hanging on a wooden stanchion; in another instance, on the top of a boiler; again, alongside an oil barrel, and so on. Engineers must be impressed with the necessity of extreme caution in this respect. Though the practice of using torches by the engineers and firemen cannot be prevented, the use of torches and candles by stevedores and cargo trimmers can and should be stopped; only closed lanterns or incandescent lights should be allowed in the hold of a vessel. In parts of the country the labor unions insist that candles be used, but the shipowners should take a firm stand and put an end to the practice.

The most hazardous type of steam vessels and one that for structural reasons always will be dangerous from a fire standpoint is the wooden tug-boat. For ease in maneuvering, to get around docks quickly and to turn in a small space it is desirable to have a tug small; to tow heavy loads and move large vessels it is necessary to have it powerful. The result is a boat as small as can be designed to carry the machinery powerful enough to do the work required, the boiler usually being the largest size that can be installed, and just as close to the woodwork as the law permits. To allow an ample passageway on deck on each side, the house is made narrow—so the boiler is entirely surrounded by woodwork placed as closely as possible to it. To make matters worse, on board the average tug there is a platform or grating over the boiler where wet lines are placed to be dried out. Dirty clothes and overalls are kept there, and frequently even cans of oil. Inside of the house, over the boiler where the ventilation is poor, the heat becomes excessive, and the woodwork around the stack is ignited, or, where there is a tight platform fitted, the bunker sides will catch fire. A large percentage of the tug-boat fires originate in this way, and they could all be prevented if good air space was left all around the boiler, and proper ventilation was provided over it to allow the hot air to escape. Many stack umbrellas have a flange on the outer edge which projects below the deck coaming, so that the hot air and gases after rising above the coaming must come down again around the flange of the umbrella.

It is the opinion of the writer that with construction of this kind the hot air and gases come up against the under side of the umbrella, and stay there. In order to provide effective ventilation the lower edge of the flange should be above the upper edge of the coaming.

The galley stove is generally in a cramped location, and all

the woodwork around it should be especially well protected. These are the two points that require most attention in tug-boats, and the smaller the tug the greater the need of care and caution.

Freight steamers are also a hazardous class. There is not only all the danger inherent in the vessel itself, but also the danger from fires originating in the cargo. It is impossible to lay down any set of rules for promptly extinguishing a cargo fire, for both the cargoes and the vessels carrying them are so varied, ranging from a deep-draught steel vessel carrying iron ore in the hold to a shallow-draught wooden river steamer carrying a deck load of cotton; most numerous, though, are general cargoes. For the safety of ships in the event of an injury, water-tight bulkheads are required in the hold and these act as fire walls tending to confine a fire to the compartment in which it starts. Every compartment should be fitted with a pipe running to the pilot-house and air should be drawn from these pipes continuously. A fire starting in the hold could be promptly detected from the smoke issuing from the pipe, which would also show exactly in which compartment the fire was located. In addition, each compartment should be fitted with a steam fire extinguisher, so that steam could be turned on immediately when the fire was discovered. The cost of installing steam-pipes is small, and at least one should be fitted to every subdivision of the hold; where the length of these exceed 50 feet, two steam-pipes should be fitted. That is the best means of effectually extinguishing a blaze below decks, as the steam can reach every portion of the hold and smother it. To attempt to use a hose would necessitate lifting the hatch covers, thus admitting fresh air. This additional supply of oxygen would cause a smouldering fire to burst out and probably get beyond control.

Steam extinguishers cannot be used on the main deck, as there is no confined space to hold the steam, nor can lines of hose always be depended upon, as the entire space may be filled with package freight and the fire may start somewhere near the middle of it, being absolutely inaccessible. The best means of extinguishing this is a sprinkler system. Many of the newer boats are so equipped, but most are not. Every vessel carrying cargo on the main deck should have sprinklers. A poor installation is about as good as none, and when sprinklers are put in they should cover the vessel completely from stem to stern and be placed close together, otherwise a fire might break out at a point not covered by the sprinklers and gain such headway by the time they opened that it could not be controlled. There is an instance of this kind on record. Fires in general cargoes are the most numerous, arising from spontaneous combustion due to overheating, or by chemical action through the mixture of different substances that may have escaped from their packages. It is impossible for the stevedores

to know the contents of every package put on board, but where anything is known to be likely to cause fire, it should be placed so that the hazard is reduced to a minimum.

CLASSES OF VESSELS.

Coal, oil, hay, cotton, jute and hemp all constitute dangerous cargoes, and vessels carrying them should be especially well equipped with fire apparatus.

The finest vessels we have are the passenger steamers, and these are being constructed better, more costly, and more nearly fireproof every year, but the danger of fire is ever present. We see advertisements in the daily papers of certain steamers: "They cannot sink, they cannot burn"; "absolutely fireproof," etc., but should a fire once get headway, there will be little left of the vessel. On account of their less rigid construction the shallow-draught river steamers cannot stand as severe a fire on board as the deep-draught vessels. They are braced with hog-chains and tie-rods and should the supporting woodwork collapse, the vessel is likely to break in two. Designers and builders of this type of vessel should consider such a contingency when arranging the longitudinal stiffeners.

The government inspection on this class has improved somewhat in recent years and owners are taking more care, but there is room for improvement.

There is one type of vessel on which there is no government inspection or supervision whatever, and on which the fire losses have been numerous and heavy, namely, contractor's plants consisting of dredges, pile drivers, floating derricks, drills, etc. While all the general notes on construction given above are applicable to these craft, there are some points of special importance. Usually over the boilers there is a dome built which has slat partitions around for ventilation—these slats are generally made so that the upper side of one is higher than the lower side of the one above it, with the result that there is very little, if any, ventilation. These slats should be arranged, having a clear horizontal space between them. The writer investigated five fires on dredges all occurring within a short time of each other, two of which were on the same dredge, a machine which had just been built at a cost of $100,000. All five fires started in exactly the same way. According to witnesses, there was a slight explosion and instantly the whole dome seemed to be in flame from end to end. In one instance where the fire had been extinguished very promptly, the inside of the dome was scorched all over, but no one place very badly burned, showing that the fire had not started at one point and spread, but that the dome had been ignited all over simultaneously. The deductions drawn were that certain gases escaped either through a leak in the uptake or while firing the boilers, and had arisen to

the under side of the dome and remained there, and had then been ignited by a flame from the furnace door while the fires were being raked. Hot air and gases will not descend, and all ventilators and openings made for their escape should be so constructed that this is not necessary. On account of the number of gears, chains, and cables which require slushing or lubricating, the amount of lubricants carried on these machines is usually large and little care or attention is given to where or how they are carried. It is not uncommon to see a number of partially filled barrels of oil standing alongside of a boiler, with perhaps a burlap sack of waste on the deck near by. When the danger of this is pointed out to the captain he will usually reply that he is too busy to pay attention to such details, or there is no other place on board to carry it, or he may promise to rectify it, and forget it. As a general thing these machines work in isolated places, or where it is difficult to reach them, and if the superintendent or captain is making satisfactory progress the owners will not visit often, and when they do, it will be to inspect the work being done rather than to examine the machine doing it. There are some firms who keep all their property in first-class order, and properly equipped, but on the majority of machines there is evidence of carelessness and disregard of the dangers of fire and insufficient appliances to cope with one. In some cases there is not even a bucket with which to extinguish a fire, and if one started it would surely result in a total loss.

FIRE EXTINGUISHERS.

Now in regard to fire extinguishing appliances generally, the most important point to bear in mind is that when these are needed they are needed badly and quickly. Many owners do not realize this, rather considering the equipment they are compelled to install as a legal requirement that must be complied with, and they put the necessary items on board with no regard to where or how they are placed. All vessels should be so equipped that every part of them can be reached promptly and effectively by fire appliances. It is an easy matter to extinguish a fire in its incipiency, but it gains headway rapidly and in a short time is beyond control of the best apparatus; therefore, every second counts. Fire appliances should be accessible and ready for instant use. The time lost in coupling up a hose which should have been connected may cause the loss of a ship. Approved fire-extinguishers should be carried in every pilot-house and in every galley. When a fire is discovered it is always reported to the man in the pilot-house, and if he has an extinguisher right at hand he can get to the fire and use it at once. A fire starting in the galley, especially from grease spilling on the stove, is always a dangerous one, but if an extinguisher can be

used instantly it can probably be controlled. In addition to these, on large vessels, extinguishers should always be carried in the crews' quarters, and on passenger steamers they should be placed in the main saloon and in passageways for use in the event of the draperies catching.

There are many worthless extinguishers on the market, which are sold only because they are cheap, and it is advisable to purchase only such makes as have been tested and approved by the National Board of Fire Underwriters.

It should be borne in mind that an extinguisher is not a fire department; its capacity is limited, and unless used promptly it is not effective. When a fire attains a size beyond the control of an extinguisher, it becomes necessary to use hose. All steam vessels should have a steam pump and a hand-pump and these should be connected to the same main, the hand-pump for use in case that steam is not up or the steam pump out of order. In no case, even on the smallest boats, should there be less than two lengths of hose, as the fire might start just at the place where one length was kept, and render it useless. The fire-main should extend to every deck, and the plugs on it should be located not more than 75 feet apart. Vessels of larger size should have a main on each side. The hose should in no case be less than 1½ inches in diameter—on many small boats at the present time 1-inch hose is used, but experience has shown that this is of no practical value whatever. On larger vessels regular 2½-inch corporation hose should be used. Hose should always be kept connected. The law requires this on passenger steamers, but on other vessels it is the regular custom to have it uncoupled, and it is frequently kept in the hold. This is bad for two reasons—first, the hose probably cannot be found when wanted; and secondly, the threads on the pipe will be filled with dirt or painted over, causing delay in connecting the hose after it is found.

In addition to being thoroughly equipped with extinguishers and hose, all steamers carrying cargo should, as already mentioned, have steam extinguishers in the hold and sprinklers between decks. Passenger steamers should all be thoroughly sprinkled, those having sleeping accommodations having a sprinkler in every stateroom. Thermostats or some type of automatic fire alarm should be fitted. On passenger steamers over 300 feet long, fire walls should be built every 150 to 200 feet, extending from the main deck to the dome. These walls should be constructed of wood at least 1½ inches thick (two thicknesses of ¾-inch tongued and grooved wood laid diagonally), covered on each side with at least ⅛-inch asbestos having sheet-iron over it. The openings in these walls should be as few as possible, and should be fitted with regular fire-doors which can be closed instantly.

GASOLINE BOATS.

Gasoline is, of course, the great hazard on these boats. The vibration caused by the motor in time loosens the joints in the piping and gasoline leaks into the bilge; a certain amount also leaks out at the carbureter. As there is always more or less bilge water in the bottom, unless water-tight bulkheads are fitted there is a film of gasoline floating on the bilge the entire length of the boat, and this, if ignited, will spread fire all over instantly.

SAFE CONSTRUCTION.

Some years ago a firm constructed launches having the tank in the bow with a water-tight bulkhead back of it; holes were bored in the planking on each side of the tank just below the water-line, allowing free circulation of water around the tank, the feed-pipes came out of the bottom and ran along the keel to the engine, which was at the aft end. Forward of the engine was a water-tight bulkhead extending above the water-line, and the entire engine compartment was lined with brass. If there was a cabin on the launch it ended forward of the engine, which was left in the open so that no vapor got inside of the boat at all. This was the safest possible construction.

WATER-TIGHT COMPARTMENTS.

The tank and the engine should both be in water-tight compartments, even though the bulkheads at each end of the engine only came up to the floor boards—and the feed-pipe should be run outside the hull. This will prevent leaking gasoline and oils from flowing the entire length of the boat. All cabin-boats should have ventilators to carry off the vapor. Many motor boats are owned by business men, who use them only on week ends, so they remain locked up tight from Sunday or Monday until the following Saturday. If any gasoline is escaping the entire cabin becomes filled with a highly explosive vapor, which may blow the boat to pieces. Many persons have been killed from this cause, to say nothing of the loss of the boats. Fires are frequently caused by gasoline cooking stoves. Only such stoves as have been approved by the Board of Fire Underwriters should be installed, and the woodwork around should be protected and no curtains should be hung near them. The main tank on the boat and the tank from the stove should be filled by daylight only and away from a flame of any kind. On motor boats carrying passengers for hire, smoking should be prohibited, as this has caused many disasters.

EXTINGUISHING FIRES.

The problem of extinguishing fires on motor boats is a difficult one, as entire dependence has to be placed on extinguishers.

If the draperies or woodwork catch fire, the average approved extinguisher can handle it, but if the gasoline on the bilge water is ignited, and there are no bulkheads, the entire boat will instantly be in flames, and if there is any quantity of gasoline it is doubtful if any motor boat carries sufficient equipment to extinguish it. The law reads that every motor boat should "carry ready for immediate use the means of promptly and effectually extinguishing burning gasoline." The act does not specify what will do this, but on June 9, 1910, the department of commerce and labor issued a circular in reference to the act, which contains the following paragraph:

"No specific means of promptly and effectually extinguishing burning gasoline are prescribed. Besides the usual fire extinguishers, suitable chemicals or bags of coarse flour or sand will serve the purpose. Imagine a man, relying on this government circular, taking his wife and children out in a motor boat with nothing but a bag of flour (itself very inflammable) to promptly and effectually extinguish burning gasoline floating on bilge water. According to government records there are over 100,000 gasoline boats in this country. There is no extinguisher the writer has ever heard of that will put out gasoline floating on water, although it has been tested several times. If one is produced it should have a large sale.

BOATS WITHOUT POWER.

The hazard due to means of heating and lighting require the same attention on this class as on other classes of boats, but the two principal dangers are fires originating in the cargo and exposure fires. When there is a donkey boiler, steam fire pumps should be fitted, and a hand-pump connected to hose on each end of the boat should always be installed. There should be a liberal supply of buckets with draw lines attached, so that they can be dropped overboard and refilled. Boats of this class are used largely as lighters or transfers; they are moored alongside docks, warehouses or large steamers being loaded or unloaded, and often so surrounded by similar craft that they cannot be moved until the others have first been taken out of the way. They are exposed to any fire that may start around them, and are helpless. A number of disastrous fires of this kind have occurred. The men in charge of all docks should use care in maintaining an arrangement which will permit all the boats to be moved promptly. At the present time, with the large amount of goods stored on piers and lighters and the necessity of covering everything, greater care than ever should be exercised.

BOATS LAID UP.

Another important point in connection with all types of vessels which should receive more consideration from owners is the

care of vessels when laid up out of commission. Too many, especially those which have not been profitable, are simply moored at an out-of-the-way dock and left until wanted again.

WATCHMEN NEEDED.

All vessels or groups of vessels should be under charge of watchmen day and night to keep off thieves and tramps, who have caused so many fires. Whenever possible, boats should be laid up under city fire protection at a place where fire-engines can readily reach them, and the man in charge should know the location of the nearest alarm box. Where a number of boats are laid up together sufficient space should be kept between them so that they do not expose each other; 100 to 150 feet is a safe distance. If there is not sufficient room to admit of this, they should be so moored that they can be cast loose readily and taken out of danger. Every winter several boats are burned by a fire starting on one, and this is a loss which is entirely preventable.

On the large and more valuable steamers, steam should be kept on the donkey boiler when the boat is out of commission, permitting the hose and sprinkler system to be in constant readiness for use.

CLEANLINESS ESSENTIAL.

Owners and managers can do much to reduce the fire loss, if they insist on captains keeping the boats clean, and having the necessary fire apparatus installed and frequent drills. Unless the crew know just what to do in case of fire and everything is in perfect working order, there is likely to be disorder on a boat when a fire breaks out and no one will know just what to do. In some cases the fire pumps have been out of order or the hose mislaid and a disastrous fire has resulted. Where the management demands and sees that proper upkeep is maintained, duties properly performed and frequent fire drills held, the sounding of the fire alarm will bring out a well-drilled crew, properly equipped, and they will invariably get the best of a fire.

EXTINGUISHING FIRE ON SHIPBOARD.

By E. J. Shallow.

Chief of Boston Fire Department.

The paper assigned to me seems to require a few explanatory remarks that may seem irrelevant to the subject proper, but which I consider are of such vital importance at the present moment that, as a fireman and an American, I should feel I was not doing my whole duty did I fail to call them to your attention. We are now engaged in the most gigantic and ruthless war known to man. Every conceivable weapon has been used against us, but the safest, surest, easiest applied, and, at the same time, the most terrible and terrifying and the one that has done the most damage, was "the torch." Fortunately "the torch" has a powerful enemy which it cannot resist when it is used skilfully, scientifically, by trained and courageous men—water. And you, and the men under you, are the trained, courageous, skilled men to use it. This must be in your minds at the first stroke of "the tapper." The nation looks to you to fight this battle, and, with God's help, you cannot fail. To supply the needs of the army of our sons and brothers and friends now in Europe, ships are a necessity. In the past our flag floated in every port, over the finest and fastest ships. Unwise legislation and economics forced our shipping down to a lake and coastwise trade. Our foreign trade was carried in foreign bottoms—we had no ships. Congress voted large sums of money, and shipbuilding was begun, but to build ships required ways, and buildings and shops and steel and men and, more than all else and much more valuable at this moment, they required time. Every energy is being strained to the utmost to supply this need.

The shipyards are doing well, but the cry is—conserve. Of course you are fully aware that a fire loss is a detriment to a community. Every part of a building and contents saved is a gain to the community. If that be the case, how much more important it must be now to save every possible part of a ship or its contents, when they are so badly needed. Every part of a ship saved is equivalent to so many hours' work on a new one. No matter how small a ship fire may appear, treat it as an incipient conflagration. Pull for apparatus and men; you may

get too many sometimes, but you cannot afford now to have too few at any time.

I shall divide my subject into two parts: 1. The fighting of fires at sea by the crews. 2. The fighting of fires on vessels at wharves or in harbors by city departments.

1. The fighting of fires at sea by crews I shall not go into here, as I feel it does not come within the scope of this paper. But there are matters in relation to this subject that the new shipbuilding programme forces us to take into consideration. Every chief and every officer here from a seaport is more or less familiar with sail and steam craft, and their construction. But we are now being confronted with new types not only of wood and steel but also of concrete of large size and equipped with various new devices. Also electricity is coming into use for propulsion which adds a new complication. Under the new way the Government is standardizing ships—that is to make as many interchangeable parts of a ship as possible, so that, should a ship need a new part any yard or shop could furnish that part, without delay, and at a minimum expense. Fortunately, these plans have not yet been worked out to a definite conclusion where they could not be changed without much labor and confusion, and the thought arises, if it be feasible, why should not the Government take the exclusive burden of fighting fires on ships from the shoulders of sailors and firemen, and place some of it where it belongs, on the owners. On war vessels the officer of the deck, by looking at a dial on the bridge at any time, knows the temperature of magazines, bunkers, etc. What an advantage to a merchant captain that would be. How much quicker a chief could get to work, if, on arrival, he was told just where the fire was located. Let us say that there are certain sizes of standardized ships. Why should Congress not pass a law that owners must install devices to locate and control fires? Why not a sprinkler system and standpipes? Perfectly feasible, a simple mechanical difficulty. It can be done, and at a cost not excessive. If good on land, where help is quickly available, at sea, with an untrained crew and possible storm, it seems to me they would be invaluable. Conservation is the word now, and will be after the war, and such action should tend to greatly cut down marine fires and save ships and, may be at times, life.

This brings us to the second part—the fighting of fires aboard ships at wharves or in harbors, by city departments. The method of fighting fires on shipboard is determined in a great measure by the cargo, whether partly or wholly laden, and how great a start it may have before the arrival. The first care is to locate the fire, the fire must be fought almost wholly from the hatchways or from holes cut in the deck, in the case of a wooden vessel. On arrival, the first care is to locate the fire, find what

the cargo consists of, and how laden. This is usually obtained from the ship's officer in charge. If he is unable to give this information, you must be guided by the volume of smoke arising from the ventilators, and the heat on adjacent parts. By these signs a shrewd guess can be made, but it is only a guess, and you may be mistaken. You then remove the covers of one or more hatches, as you think necessary, and turn the streams from fire-boats and steamers into the hold. It is obvious that in only very rare cases are men ordered into the holds, and in the case of explosives and certain goods and chemicals that generate noxious fumes and gases, it would be impossible for men to enter. If the ship is loaded to the hatchway you must flood the ship to the point of the fire. If partly loaded, the streams may put out the fire on their way down, if the volume is not too large. But it is safe to say that in this case, also, you must flood the ship to the point of contact with fire. As stated above, where fumes arise the ship must be flooded at a safe distance, to avoid loss of life.

In some cases it is advisable, where it can be done, to open sea cocks, break ports and scuttle the ship, which is practically flooding it. Unlike fires ashore, there is little or no chance to remove the cargo and get at the actual seat of the fire, and it can be subdued only by actual weight of water, or flooding. I have tried to make it clear that the only way fires on shipboard of any magnitude are subdued is by flooding them out, and I give that as my professional opinion, which I believe experience will confirm.

OPEN POLICIES AND SPECIAL CONTRACTS.

By Joseph A. O'Brien.

Member of the Association of Average Adjusters of the United States.

Marine policies on cargo are valued policies. The value of the goods for all purposes of the insurance is the value named in the policy. The value is not always expressed in currency—it may be "invoice" value, "market" value or it may be expressed in money. In the absence of any value being named, then the amount insured is assumed to be the value. Cargo insurances on imports and exports to and from foreign countries are arranged either under open policies or special insurances for each voyage. An importer usually takes out an open policy, which is a contract between the insured and the insurer, in which the underwriter agrees to insure all the importations, same to be reported to the underwriter, and the premiums thereon paid when the importer receives the necessary shipping documents, and the importer on his part agrees to report to the underwriter all shipments received by him. These open policy contracts are sometimes made for a limited period, but more frequently they provide that they are to remain in force until cancelled by either party on giving the other so many days' written notice. It is usual in such policies to fix the valuation at the invoice plus a certain per cent. (so as to cover profits), say "Invoice and 10 per cent." or "Invoice plus 20 per cent.," etc. Sometimes an arbitrary rate of exchange is fixed so as to cover the profit, for instance, "Valued at invoice the pound sterling at $5.50," "Valued each pound sterling of invoice at $5.00," etc., etc., but whatever the valuation, the premiums and claims are settled on that basis.

Export shipments by large exporters are usually covered under open policies, but not always. Some shippers prefer to negotiate insurance on each shipment. Usually the shipper making a large shipment, perhaps an entire cargo, requires reimbursement at once from the consignee for the value of the goods; in fact, all large transactions are so conducted and financed through bankers. The shipper makes a draft on the consignee, either at sight or for a term. The original invoices and bills of lading are attached to the draft, which the banker then discounts, provided he is protected by marine insurance. The shipper obtains from his underwriter a "certificate of insur-

ance" covering the shipment. The certificate makes the claim payable to the holder thereof, provided he produces the necessary documents to substantiate the ownership, and is payable at a designated office of the insurance company in the port or country to which the shipment is destined. The banker forwards these documents to his house at the port of destination, and they are surrendered to the consignee on payment of the draft. If the shipment is lost on the voyage, the banker collects the claim from the underwriter in payment of his draft. In the event of claim for damage or general average contribution the consignee applies to the settling agent named in the certificate of insurance.

The foregoing applies to foreign shipments. Domestic shipments are insured by either shipper or consignee, sometimes under open policies, sometimes under special insurance for the voyage, and frequently, where the shipper has numerous small shipments of nominal value, under annual or blanket policies. Under such annual policies a fixed premium is paid based on the estimated value of the shipments during the year and the maximum amount at risk at any one time. The valuation under such policies is usually the invoice or the market value.

Nearly all the coastwise steamship lines issue, upon request, an insured bill of lading, and in many instances the rates of freight between certain points include marine insurance. Under such circumstances the carrier effects with the regular marine insurance companies insurance protecting its liability under all such bills of lading.

Many shippers and others who have known of claims for marine loss under insured rates being collected from carriers, have concluded that coastwise steamship companies are obliged under the law to pay all claims, and many vexatious questions have thus arisen.

There is another feature of the carrier's liability that has caused much controversy, especially with attorneys who are not familiar with admiralty law, and who attempt to enforce claims against carriers after a marine disaster on the ground of negligence. The writer has had many such experiences in the adjustment of losses where vessels have stranded. It must be clearly understood that if the owners of a vessel have exercised due diligence as to the seaworthiness of the ship and in the selection of the officers of the ship they cannot be held liable for errors or negligence in the operation and navigation of the vessel.

Quotation, 3d section "Harter act," passed by Congress of the United States, February, 1893:

"Sec. 3. That if the owner of any vessel transporting merchandise or property to or from any port in the United States

of America shall exercise due diligence to make the said vessel in all respects seaworthy and properly manned, equipped, and supplied, neither the vessel, her owner or owners, agent, or charterers shall become or be held responsible for damages or loss resulting from faults or errors in navigation or in the management of said vessel nor shall the vessel, her owner or owners, charterers, agent, or master be held liable for losses arising from dangers of the sea or other navigable waters, acts of God, or public enemies, or the inherent defect, quality, or vice of the thing carried, or from insufficiency of package, or seizure under legal process, or for loss resulting from any act or omission of the shipper or owner of the goods, his agent or representative or from saving or attempting to save life or property at sea, or from any deviation in rendering such service."

A claim for total loss of cargo can be made in the event of the absolute total loss of vessel and cargo from sea perils, or of any disaster by which the cargo is totally destroyed. It can also be claimed in a case where the cargo has been sold in an intermediate port of distress by reason of its being so damaged that it could not be forwared to destination. There are a few other conditions under which a total loss on cargo can be claimed, but as a general rule, if the cargo is ultimately carried to its port of destination and arrives in specie, no matter how badly damaged, claim for total loss cannot be maintained. In claiming total loss from the underwriter it is necessary to produce: Certified copy of the master's protest, original or certified copies of the invoices, full set of the bills of lading and policy or certificate of insurance.

Particular average on cargo is damage from sea perils to the goods insured. This may result from fire, sea water or by being broken or damaged in any way in consequence of a disaster. Particular average cannot be construed to mean damage by rot or any inherent vice in the goods themselves or from being musty, mouldy, spotted or mildewed due to long voyages where no disaster has occurred.

Marine policies usually contain a provision that a claim for particular average must reach a certain percentage before it becomes a claim under the policy. In American policies it is usually 5 per cent. of the shipment; in English policies, 3 per cent. These conditions are frequently modified by special agreement on the policy, by which the average is made applicable to a limited number of packages or certain divisions of the invoice; sometimes it is made applicable to each case. Special terms are also frequently made with respect to packages subject to leakage, such as oil, molasses, etc., in which case provision is usually made exempting what is termed "ordinary leakage" to which such commodities are susceptible. Another form of

particular average insurance is known as English conditions, and pays for loss or damage, no matter how small the percentage in the event of stranding, sinking, burning or collision. The clause reads:

"Free of particular average unless the vessel be stranded, sunk, burnt or in collision."

Another form known as American conditions is as follows:

"Free of particular average unless caused by stranding, sinking, burning or collision."

To the layman there would not seem much difference in the above clauses, but in practice the words "caused by" have a very material bearing. Under the English clause, if the vessel has a slight collision or a stranding which does no material damage, it opens the warranty, and any claim for particular average from other causes that has occurred on the voyage is collectible without regard to percentage. Under the American clause the particular average must be caused by the perils mentioned in the clause: Some years ago a vessel loading grain at one of the Atlantic ports, when just about completing loading, was run into by a scow or railroad float and a plate above the water line was cracked, it was repaired and the vessel sailed on her voyage. She encountered most severe gales, during which she shipped great quantities of sea water, which, getting into the holds, caused the grain to swell and a most serious damage resulted. The grain was insured under the "English condition" clause and claim was made on underwriters that the collision referred to opened the warranty. This was disputed by the underwriters on the ground "the voyage had not commenced," but it was eventually held that the warranty was opened and the underwriters were obliged to settle.

Goods perishable in their own nature underwriters rarely insure subject to particular clause, and then only at largely advanced rates. Such goods are usually insured "free of particular average," which means the underwriters pay no claims for damage, and such insurance is only against the risks of total loss and general average. The rates of insurance, also the conditions of average, vary according to the character of the vessel, the season of the year, and the particular circumstances of the class of business under consideration. There is quite a distinction between steam and sailing vessels, also regular lines or "tramp" steamers. Usually sailing vessels take the highest rates, while the first-class line steamers regularly employed between stated ports command the lowest rates.

TRAFFIC CHARTS OF THE SEA.

Marine underwriters are naturally interested in the enormous sea traffic which America has built up. Every six minutes nowadays some merchant vessel arrives and another departs from American ports. Including coastwise traffic, there is a departure from North Atlantic seaports every eleven minutes—one for Europe every forty minutes. This rate of operation does not include vessels in the service of the Army and Navy; the ships which are weaving these inward and outward bound wakes are merchant vessels under the control of the Shipping Board.

This fleet now numbers more than 1,500 ships, and because of the need that they do the utmost work they are capable of in the shortest possible time, their movements are checked up with the same precision that obtains on railroads. Over them now is concentrated the authority of the Shipping Board, an authority absolute as that exercised by the Director General of Railroads over the railway systems.

Chairman Edward N. Hurley of the Shipping Board has brought his business methods into the administration of this vastly important department.

Under his directions, the Division of Planning and Statistics of the Shipping Board, a highly important, but little known part of that great organization, is charged with the duty of measuring the performances of the ships against their tasks. In order to do this it must know fully what the tasks are, and so it co-ordinates with the War Industries and War Trade Boards in ascertaining and providing for this country's requirements from abroad, working on month to month schedules and as far in advance as it is feasible or possible to forecast.

The Division of Planning and Statistics, under the direction of E. H. Gay, formerly Dean of the Harvard Graduate School of Business as its name indicates, does the planning for the use of the ships where they will do the most good. It works with the Food Administration in planning the shipping requirements for foodstuffs, with the War Industries Board in trying to solve the problem of providing the United States with the necessary raw materials from South America and other parts of the world, with the War Trade Board in preparing and paring the lists of essential imports and exports, and with the War Department in correlating shipping with the requirements of the line of supplies to the Western Front.

This big and complex work has required the Shipping Board to gather comprehensive information about the commerce of

this country, the ships in actual operation and their relation to the trades in which they are engaged. As this compilation of data has proceeded--as the country has gone more and more on a war basis—it has been found necessary to limit the list of essential commodities to be imported to less than 100. On those trades has been concentrated the available shipping, and just as the production of ships is supremely important these days, so the use of ships with maximum efficiency is paramount.

The data relating to the ships and their trade, which is thus gathered and recorded, furnishes the basis for the actual operation of the vessels that are under the control of the Shipping Board, and to a considerable extent for the operation of neutral vessels coming to this country or linking up somewhere with its trade. Plus the 1,500 vessels under the authority of the Shipping Board—subject to the orders of the Shipping Control Committee—the records of the Division of Planning and Statistics list 3,000 engaged in commerce that bring commodities to the United States and about 2,500 others scattered around the globe, trading for the most part with the Allies or their colonies. All told, the Shipping Board follows the movements of more than 7,000 vessels or, roughly, about one quarter of all the merchant ships in the world. Lloyd's Register for June, 1914, shows a grand total for all countries of 30,836 steam and sailing vessels over 100 tons.

The system employed by the Division of Planning and Statistics in keeping tabs on 7,000 ships is the Gantt Progress Charts, a graphic method of measuring performance against task. It has been thoroughly tried out and developed in such highly organized manufacturing plants as the Cheney Silk Mills, the Remington Typewriter Co. and the Ordnance Bureau of the War Department. The charts show at a glance just what work the ships have to do and how they are doing it. They have been adapted to the shipping industry by Henry L. Gantt, the engineer who originated them, and under his supervision are now kept posted by Wallace Clark, one of his assistants.

There are ten divisions to the sets of charts employed by the Shipping Board—one each for movements of vessels, turnarounds, ship charts of commodities, individual commodity charts, summary of imports, individual trades, summary of trades, ship charts of exports, performances in ports and dock performances. A complete set of those charts contains about 200 photostated sheets. They are so arranged that they fold compactly to the length and width of a large square sheet of typewriting paper. About 1,000 copies are prepared for distribution every ten days among the various government offices which require constant information about the movement of supplies.

The purpose of the movement sheets is to keep in one place all information in regard to locations and movements of vessels

so that at all times it is possible to know where a vessel is, what she has done in the past, and to forecast from her actual performance the time it will take her to make future voyages.

These sheets have columns ruled off for each day with double lines to mark off the weeks. Simple signs are used to indicate the movements of the vessels. A right angle, opening to the right, indicates the arrival of a vessel in port. An angle opening to the left indicates a departure from port. A line drawn to connect these two angles shows the time the vessel spends in port.

The important story of time expended is told in a glance. Inaccurate reports are made plain. Mistakes in dates become immediately apparent because two different entries of movements cannot, of course, be written in the same date space. Just how fast the ships are making their voyages from port to port, when they are working and when they are idling, what use, in short, they are making of their time—all these facts are told on the movement sheets by simple lines and symbols.

For example there is the entry for the speed ship, *Tuckahoe,* the collier that was built by the New York Shipbuilding Company in the record-breaking time of 37 days. The *Tuckahoe* is in the coal carrying trade between Baltimore and Boston. The chart reveals tersely, but fully, every trip the *Tuckahoe* has made since she was placed in commission, last May, the number of days in port, whether loading or unloading, the number of days at sea, cargo carried and the relation of that cargo to her capacity —all these facts told by perpendicular and horizontal lines plotted against the calendar.

Perhaps the most interesting of all the port sheets deals with ship performances in New York harbor. Here the symbols and lines, crowding together like Chinese characters, tell tersely the whole story of each ship's stay in port. A brief acquaintance with the key to the symbols clears up the circles, angles and lines. How quickly one vessel comes and goes, how slowly another—the reasons for delay if any—the chart shows at a glance, also facts about the ship's allocation, cargo and future destination, all condensed on a graphic chart. These charts reveal the work carried on by the various vessels both in relation to the trade and with one another, what each ship is doing to-day, what it will do to-morrow, what it did last week and what is expected of it in the ensuing week; what her cargo capacity is, how much she is actually carrying, and the time it takes her to do her work. On such charts the efficiently operated vessels stand forth clearly; the slow ones show up in sharp contrast as in all other war work; it is results which count these days, and the ship charts of commodities tell the story quickly to the Shipping Board officials and so provide them easily with the data they need for ordering such changes as will deliver the goods.

The use of ships in the essential trades is shown on special sets of charts—what the requirements in those trades are and how the receipts match up with them. One glance at the sheet, for example, covering the movements in the nitrate trade with Chile shows what each vessel in that trade is doing and what progress is being made—in short, the day to day status of that trade and the effectiveness of the ships. You can tell quickly by the lines whether the ships are keeping up to their schedules, and if anything is wrong, the reason for it. The vital importance of knowing at all times clearly the status of this trade and the ships engaged in it may be understood when it is stated that nitrate is one of the most essential ingredients in the making of war munitions and one of the best known fertilizers. It is perhaps the most important foreign trade of this country to-day.

The condensed summaries of shipping and trade, and of both in relation to each other, which are prepared every ten days for department heads of the Shipping Board, War Industries and War Trade Boards and for the Food Administration, help shape the larger policies underlying the use of our ships in war time. The charts reveal whether the ships allocated to the various trades are enough, too many, or too few; whether they are bringing in too little, or too much; whether they are doing their work on time, ahead of time, or behind time, and whether the trade movement is just right, too slow or too fast. All these facts are shown in juxtaposition to the fixed requirements by a few heavy and light horizontal lines plotted against the calendar.

DIRECTION OF SHIPS.

Similar charts serve to guide the Bureau of Operations and Shipping Control Committee in the assignment and direction of ships in the various trades listed as essential, and in which the requirements have been definitely fixed by the War Industries Board. If the charts show, for example, that the country is ahead on certain imports, like sugar or bananas or cocoa, the Shipping Control Committee can perceive those facts in a few moments and with equal celerity know how much tonnage it may take from those trades temporarily and put to work bringing in other essential commodities in which the movement may be behind the schedule of requirements. By juxtaposition of requirements against deliveries the charts also show the Shipping Control Committee when any vessels may be spared from this or that commercial trade and released to the Army.

MARKET VALUE CHANGES.

By Joseph A. O'Brien.

Member of the Association of Average Adjusters of the United States.

Claims for damages to cargo (particular average) as applicable to fluctuations in market values are often unsatisfactory to the claimant, owing to the conditions not being understood, but if the following illustrations are carefully studied it will be seen the conditions are not only fair and equitable, but in fact could not be reconciled in any other way.

Remembering that we are dealing with a valued policy and the value for all purposes of the insurance being fixed, the only way in which the claim can be determined is to first ascertain the percentage of depreciation by reason of the disaster, and then apply that percentage to the insured value.

We will assume that during a long voyage the market value has largely advanced and the goods are worth much more than the insured value had they arrived in sound condition:

EXAMPLE:

Insured value	$10,000.00
Market value	15,000.00

Goods sold at auction to determine depreciation realize gross proceeds of $7,500.00.

Market value	$15,000.00
Sold for	7,500.00
Depreciation	$7,500.00

Equal to 50% depreciation.

Claim—50% of insured value of $10,000.00=$5,000.00.

We now take for illustration the same example where the market has fallen off and the goods on arrival if sound are worth only $7,500.

Insured value	$10,000.00
Market value	7,500.00

Goods sold at auction realize gross proceeds of $3,750.00.

Market value	$7,500.00
Sold for	3,750.00
Depreciation	$3,750.00

Equal to 50% depreciation.

Claim—50% of insured value of $10,000.00=$5,000.00.

It will be seen from the above that it would have been unfair to the claimant in the first instance to have taken the position that since the goods realized $7,500 at auction that the underwriter should only pay the difference between that sum and the insured value of $10,000 (or $2,500). It would be equivalent to the underwriter taking 50 per cent. of the profit on the shipment when he did not insure and had no interest in the profit.

It would be equally unfair to ask the underwriter in the second instance to share 50 per cent. of the loss of profit in which he had no interest. In both examples it will be noted the underwriter sustains exactly the same loss—viz., 50 per cent. of the insured value.

Duties on imports must be considered in insuring import shipments. In the event of total loss duties need not be considered, nor in the case of general average, but they affect the value of the goods in the adjustment of particular average, since the government requires payment of the full duty, whether the goods are damaged or not, therefore, in order to be fully protected against particular average claims it is necessary to insure the duty. The rate of premium on duty is much less than the rate on the goods since the underwriter only insures against particular average, as there can be no total loss or general average claims on duty.

EXAMPLE: Under policy insuring invoice, plus 10%, including duty:

Invoice	$10,000.00
Plus 10%	1,000.00
Duty	3,000.00
Total insured value	$14,000.00

ADJUSTMENT:

Market value	$13,000.00
Value in damaged condition	6,750.00
Depreciation	$6,750.00=50%

Claim—50% of insured value of $14,000.00=$7,000.00.

EXAMPLE: On same shipment with duties not insured:

Invoice	$10,000.00
Plus 10%	1,000.00
Total insured value	$11,000.00

ADJUSTMENT:

Market value	$13,500.00
Value in damaged condition	6,750.00
Depreciation	$6,750.00=50%

Claim—50% of insured value of $11,000.00=$5,500.00.

Goods shipped "on deck" are not insured unless by special agreement. The ordinary marine policy covers only "under deck." Rates of insurance "on deck" are much higher than "under deck," and as a rule cover only the risks of "total loss," "jettison" and "washing overboard." Insurance on goods shipped on deck usually contains the following warranty:

"Free from claim occasioned by wet, leakage, breakage or exposure on deck."

Deck structures, shelter decks, etc., are all considered as "on deck."

Under deck is construed to be that portion built into the "framing" of the ship.

FREIGHT.

Freight is the consideration for carrying the cargo to destination and payable on delivery of the cargo at the termination of the voyage. It is subject to the same perils as vessel and cargo and is an insurable interest. If the vessel owner desires full protection he must insure the freight. Insurance can be obtained for the voyage or for a term.

Advanced freight—that is, freight paid before the voyage commences—ceases to exist as freight, it then becomes enhanced value of cargo, and the cargo owner assumes the risk thereof, and if he desires to be fully protected must increase the insurance on cargo accordingly.

It is important that the shipper who pays the freight in advance clearly understands this condition, particularly in view of the high rates of freight at the present time and the fact that many vessel owners are demanding freight in advance on shipments across the Atlantic and to South America. In the case of some cargoes (coal for instance) the freight is much greater than the value of the cargo, and in the event of general average, if the freight has been paid in advance, the cargo would have to pay the contribution that otherwise would be paid by the freight interest.

WAR RISKS.

War risks are underwritten either for a term or for a voyage and are governed by the conditions existing at the time the insurance is effected. Usually a separate policy is issued, although sometimes it is endorsed on the marine policy. War risk quotations are for immediate acceptance or say within a limited time (usually 48 hours). Rates fluctuate from day to day as conditions vary. The present European war has produced many unusual conditions that have had a bearing on war rates. At first all underwriters granted war risk insurance against acts of any of the belligerents. This was followed by underwriters of the various countries confining the risk to acts

of their enemies. For intance English companies declined to insure war risk against the acts of Great Britain or her allies. Owing to the great values desiring protection (being in some cases greater than the market for insurance), and to assist the British shipping interests, the Government of Great Britain established a war risk insurance bureau and war risks for large sums were underwritten by the British Government. This action was followed by France and Italy, and by the United States. There is now a War Risk Insurance Bureau established in Washington underwriting war risk on vessel or cargo per American vessels only.

It is desirable where possible to place war risk and marine insurance with the same underwriter for the reason there are contingencies where it is doubtful whether the disaster is from war risk or marine peril. There is a case at present in litigation where a vessel was seized by one of the belligerents, a prize crew placed on board and the vessel ordered to proceed to a certain port for examination and decision as to whether she was a prize; while en route to that port with the prize crew on board she was wrecked and became a total loss. The war risk underwriter refused to pay on the ground the loss was caused by a marine peril, and the marine underwriters refused under the provisions of the "free from capture" clause in the policy. Certainly the loss falls under one policy or the other, and if insured with the same underwriter there could be no question. (This case has not yet been decided.)

GENERAL AVERAGE.

The following remarks on general average are intended to give the reader an understanding of the primary fundamentals only. The subject is broad and far-reaching, and although volumes have been written covering almost every contingency, yet in the experience of every average adjuster new questions arise for which there are no precedents and not infrequently it becomes necessary to bring such matters before the admiralty courts.

When a vessel sails on a voyage there are three separate and distinct interests involved in the adventure, viz., the vessel, the cargo and the freight being earned by the vessel on that particular voyage. If from perils of the seas some extraordinary expenditure or sacrifice becomes necessary for the benefit of the entire adventure it thus benefits each of these interests, therefore all three interests must contribute proportionately to such expense or sacrifice.

When a vessel has incurred general average so soon as she arrives at the port of destination bonds binding the signers to pay their proportion of the general average are taken from the consignees in favor of the ship before any cargo is delivered.

These bonds are known as general average bonds, and must be secured by either underwriters' guarantee or a cash deposit. A general average statement is later prepared by a qualified average adjuster, in which all the charges are properly apportioned to all the various interests and collections are then made from the cargo owners under the bonds. Where the cargo owner has effected insurance the underwriter protects. It will be seen from the above that although a consignee may receive cargo in perfect condition, a very heavy general average charge may have to be paid. There have been extreme cases where the general average contribution has nearly equalled the value saved.

The principles of general average had their origin under the old "Rhodian" law of jettison which provided that "if it became necessary to lighten the ship and a jettison of merchandise was made which is sacrifice for all, the value shall be made good by a contribution of all." This has gradually grown and the principles are now extended to all forms of voluntary sacrifice or expenditures for the general benefit.

A few instances constituting general average may be cited as follows:

1. Jettison of cargo.
2. Damage done by the act of jettisoning cargo.
3. Cargo burnt as fuel on the steamship for the general safety.
4. Damage done by water used in extinguishing fire.
5. Expense of floating the vessel when stranded.
6. Cost of salving ship and cargo.
7. Damage to vessel or cargo caused by the act of floating stranded vessel.
8. Expense of entering a port of refuge to repair damage.

The above are a few of the principal items constituting general average according to law.

In determining general average the following rules apply:

1. There must be a genuine peril.
2. There must be an expense or sacrifice to avoid that peril.
3. The sacrifice or expenditure must be a voluntary act on the part of the master or proper authority in command.

If further information is desired the writer would refer to "Lowndes on General Average" and "Gourlie on General Average." There are further valuable works introducing later developments in general average, one written by Mr. W. R. Coe, of New York, and one by Mr. Ernest W. Congdon, of New York.

PLACING MARINE INSURANCE.

By Charles W. Benfield.

Of Frank B. Hall & Co., New York.

Probably one of the most interesting and important positions in the marine insurance business is that of the placer for a brokerage concern. Some people regard it as an easy vocation, but the work requires a great deal of tact, perseverance, diplomacy and a general knowledge of marine conditions.

A placer's duties may be likened to those of a salesman of a mercantile house, except that the salesman sells the wares of the firm whom he represents at as high a price as it is possible to obtain, while the placer's duty is to persuade the various insurance companies to sell to his assured at as low a rate as possible; and he must in turn, through the inside executives of his firm convince his assured that he is getting adequate protection at the proper rate. The latter is sometimes a difficult task, as some assurers do not always consider the quality of the insurance as much as the low rate, and provided there is a saving of a few dollars, they do not always look into the source from which the insurance originates.

The assured is constantly receiving low rate quotations on his business, and very often keeps constant pressure on his brokers with a view to spurring them on to even a lower rate, and the placer is the man to whom is entrusted the task of ascertaining whether or not the "required" rate can be obtained, together with proper security. It might be here stated that no matter how efficient a placer may be, he cannot always be the man to produce the lowest rate. He must lose out sometimes.

As is the case with the salesman, the placer must have the gift of being versatile, both in dealing with the underwriter and the assured. In New York there are approximately one hundred insurance companies, all competing for business on one scale or another, and it is safe to say that the placer for any fair sized brokerage house comes in constant contact with twenty or more underwriters. Each of these probably has a distinct and different personality; therefore, each must be approached and negotiated with in a different manner. An experienced placer can generally outline where the market can be obtained for each particular insurance, and also in which order to interview the various underwriters. It is a well known fact that certain underwriters are considered authorities on

certain classes of business, and if they are approached first, and their line obtained, other underwriters will follow their lead. In this manner the placer can generally eliminate a great deal of discussion and save considerable time, not only for himself, but for some of the underwriters.

Probably one of the greatest difficulties encountered is the "full market," which is very often the case when the risk to be placed is particularly unattractive. It does happen quite frequently, however, that the risk and rate are all that could be desired by an underwriter, but he cannot accept more than his "limit," which is determined by the amount of his resources, unless he wants to take a chance on obtaining reinsurance. In such a situation, the placer must be on his mettle. Before reporting a "full market" to an assured, he must thoroughly try every company, for it is known that an insurance order may often be completed from the least expected source. A favorable impression would not be created should the assured turn the risk over to a competitor who might happen to place the required line with the only company who had not been tried.

A word or two might here be said regarding the relations which exist between the placer and the underwriter. Both are, to a certain extent, reliant on each other for the profitable development of their respective businesses, and a spirit of reciprocity should prevail. It is easy for a placer to go out with a lot of good business and finish it. There is, however, a certain amount of business which may be quite unattractive from an underwriter's point of view, It is in such an instance that the placer needs assistance from his underwriting friends, and it is only natural to suppose that he will bear in mind those who help him; there are many ways in which he can reciprocate. Each placer receives a certain share of profitable business, and it may be assumed that he will give those underwriters who took the unprofitable business the first offering of the good business.

One of the most vital factors in a placer's work is the necessity for the truth. Nothing can hurt a man in this vocation more than the deliberate misrepresentation of the risks he offers. Sooner or later the misrepresentation will be discovered and his word will not thereafter have the value which it should. At times it is hard to stick to this policy, for it often means failure to arrange the required insurance. It is, however, perfectly in order for him to present his various risks with the bright side forward. The underwriter will take care of the dark side of them, and between the two a happy medium may nearly always be obtained.

There are some who say that an underwriter must have a good knowledge of the lines and of the business, but that the placer should not interest himself with such things as losses.

This is incorrect. Each and every risk he places is susceptible to some particular loss, which is in some cases governed by the conditions in the country to which the vessel or cargo is destined. It is only natural that the underwriter will in his argument set forth as strongly as possible these susceptibilities, and the placer in countering should have at his disposal the knowledge of the actual damage and loss which does result.

In the course of his work the placer should, and generally does, employ an extensive knowledge of geographical conditions, and also a general understanding of conditions existing in various countries, especially the ability of people of foreign nations to properly take care of the merchandise which is imported and exported.

The war has added a great deal to the problems of underwriters and brokers. In times of peace, conditions and losses can be judged fairly accurately, but congestion and irregularities of transportation under war conditions are such that it is very hard to tell just how long a certain shipment will be at risk. The underwriter knows this, and holds off as much as possible on anything where he thinks the goods may lie around on docks or wharves, or in sheds or warehouse before finally reaching the destination. The placer knows of this condition, and is often pushed hard to get the proper protection for his assured. The question of war risk insurance has also been a large problem, and for a while it was very hard to secure insurance against these new perils, especially on shipments to Europe and the Mediterranean. The Governments of Great Britain and America relieved the situation by the inauguration of their War Risk Bureaus which are taking care of large amounts at much lower rates than were prevailing at the time they entered the field.

During the last year, reinsurances from foreign countries have been offered on the American market by the placers of several brokerage houses, and while difficulty was at first encountered a number of underwriters have found that there is money to be made by accepting this business which is expected to become a large item, bringing into this country premium which would have otherwise been absorbed by other countries. Owing to the shortage of tonnage, many vessels which had been consigned to the scrap heap have been resurrected and put into use to offset the tonnage sunk by submarines. The placer has been called upon to obtain the necessary insurance for the hulls and cargoes of these vessels, and it must be said that a large number of the underwriters have reciprocated and responded to this emergency, and owing to the large volume of such business have been able to make a fair profit on their ventures.

HIGHER MARINE RATES NEEDED.

In view of changed conditions and the introduction of many new hazards, marine underwriters are seriously disturbed over the immediate future of the business and feel that rates should be at least doubled if the companies are to break even on straight marine business. Coastwise hull business this year is showing a loss, cargo business is producing a very slender margin of profit, and the only satisfactory source of revenue is limited to war risks.

This feeling of alarm is shared by the experts of the classification societies, surveyors, marine underwriters and all others who are familiar with present conditions in this line. The three leading classification societies—British Lloyds, the French Bureau Veritas, and the American Bureau of Shipping—prescribe rules and regulations to which vessels must conform before they will be given certificates and a class. This information is of the first importance to marine underwriters because in open cargo business they have to write any boat rated A-1. The predicament of the classification societies arises out of the enormously increased volume of shipping that is being turned out of American yards by the Emergency Fleet Corporation. This output has now reached 4,000 tons a month. The physical character of the new vessels is in every way satisfactory; there is no complaint on that score. The serious element of the problem has to do entirely with the inferior grade of care and handling to which these vessels are subject, and the difficulty in keeping old vessels up to standard.

The tremendous increase in the construction of shipping has necessitated the employment of all the sailing talent this country possesses. The greatest importance attaches to the Trans-Atlantic service, because men and munitions must be transported to France. To secure masters and crews for these ocean-going vessels the Government has had to transfer to ocean work practically all of the most experienced men who have been operating our coastwise traffic. These coastwise ships are now manned and navigated by men of limited experience, and marine underwriters are complaining of the increasing number of claims and losses arising as a result of collision and poor handling.

There are three principal reasons for this increase in coastwise losses. First, inexperienced navigators; second, the effect of the submarine on sailing orders; and third, the removal of

important aids to navigation. The first reason has been discussed above. With regard to the second, it has to be borne in mind that with the advent of enemy submarines along our Atlantic Coast the Goverment has issued instructions to navigators to hug the shore. A submarine cannot operate effectively in less than eighty feet of water; the average submarine's hull is twenty feet high and the periscope is 30 feet more; therefore, in order to submerge all but the tip of the periscope, a depth of at least eighty feet is necessary. Now, a great part of our Atlantic shore line is shelving, and a submarine frequently has to operate miles off shore in order to get a safe depth. The theory of the Government is that by keeping as far as possible in-shore, ships might be able to escape the raiders. But a serious problem arises here for inexperienced navigators. Not only is it difficult to sail a ship in shallow water where a heavy undertow prevails, and pounding on a sandy bottom is imminent when to the weight of the vessel is added the momentum inescapable in coming down from the crest to the trough of a wave, but many of the regular aids to navigation, such as light-houses, light and bell buoys, etc., have been removed in order that sailing data of this character may not be available to the enemy. The result has been numerous collisions, the breaking up of ships by pounding on shallow beaches, strandings, etc.

The cost of repairs enters here, and it is one of the most imposing elements in marine underwriting at present. By the terms of his policy the marine underwriter agrees to indemnify shipowners from loss or damage sustained on a specified voyage. The cost of making these repairs has increased tenfold in the last three years. The influence of union labor at Washington has led to a tremendous increase in the wage schedule, despite the fact that inexperienced men are employed in the yards and that the work turned out is inferior to what it has been in the past.

The following rates are being charged for the various labor required on all ship repair work in the port of New York, as of 1918 in comparison with the same items in 1914. The calculations for 1914 are based on an eight-hour day for outside work, and a nine-hour day for inside or shop work; double time was charged for all over-time for inside and outside work. The 1918 figures represent an eight-hour basis day for both inside and outside work, with over-time charges as follows: Double time is allowed for inside or shopwork, and two-and-a-half time for outside work. It might be added that docking charges on 1,500 tons and over compare as follows: In 1914, haul, .10; in 1918, .16. In 1914, lay, .08; in 1918, .14. The minimum charge is $100, to which is added 5 per cent. compensation to the labor charges.

	1914.	1918.
Smith Fire	$10.00	$20.00 per day
Large Smith Fire	15.00	30.00 per day
Extra Blacksmith Helper	3.25	7.20 per day
Boilermakers	4.50	9.60 per day
Carpenter	4.50	9.60 per day
Caulker	4.50	9.60 per day
Coppersmith	4.50	9.60 per day
Draftsman	6.00	13.20 per day
Electrician	4.50	10.00 per day
Ironworkers	4.50	9.60 per day
Joiners	4.50	9.60 per day
Machinists	4.50	9.60 per day
Machinists Helpers	3.25	7.20 per day
Patternmaker	5.80	11.20 per day
Pipefitter	4.50	9.60 per day
Plumber	4.50	9.60 per day
Rigger	4.50	9.60 per day
Tinsmith	4.50	9.60 per day
Foreman	5.50	11.20 per day
Air Chipper	6.00	8.00 per day
Air Drill	6.00	8.00 per day
Angle machine	8.00	16.00 per day
Air Riveter	8.00	10.00 per day
Acetylene Welder	8.00	10.00 per day
Acetylene Cutter	5.00	6.25 per day
Annealing Machine	10.00	20.00 per day
Bending furnace	40.00	64.00 per day
Backer out	8.00	8.00 per day
Boring bar (large)	12.00	24.00 per day
Boring bar (small)	10.00	20.00 per day
Bolt cutter	6.50	16.00 per day
Boring Mill (large)	12.00	32.00 per day
Boring Mill (small)	10.00	24.00 per day
Channel Cutter	8.00	16.00 per day
Countersink	6.50	16.00 per day
Drill (large)	9.00	20.00 per day
Drill (small)	6.50	16.00 per day
Electric drill	6.00	8.40 per day
Electric welder	——	10.00 per hr.
Flange fire	20.00	30.00 per day
Forge (large)	15.00	30.00 per day
Forge (small)	10.00	20.00 per day
Gas cutter	5.00	6.25 per hr.
Gas welder	8.00	10.00 per hr.
Grinding machine	——	16.00 per day
Key Seater	6.50	16.00 per day
Lathe	6.50	16.00 per day

	1914	1918.
Large Lathe	10.00	28.00 per day
Launch	5.00	6.00 per hr.
Milling machine	8.00	24.00 per day
Oil furnace	40.00	64.00 per day
Pipecutter (large)	12.00	24.00 per day
Pipecutter (small)	9.00	16.00 per day
Plate Rolls (large)	30.00	52.00 per day
Plate Rolls (small)	10.00	24.00 per day
Plate Rolls (medium)	20.00	32.00 per day
Punch and Shears	8.00	24.00 per day
Plate Planer	20.00	32.00 per day
Shaper	6.50	16.00 per day
Slotter	6.50	24.00 per day
Steam Hammer	6.00	20.00 per day
Steam and Hose for Washing	——	5.00 per day
Valve seating machine	8.00	20.00 per day
Wood working machine	8.00	20.00 per day
Planer (large)	10.00	24.00 per day
Planer	6.50	16.00 per day
Cold Press	6.50	16.00 per day

GENERAL AVERAGE ADJUSTING.

By C. P. Dorff.

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The law of general average is part of the Maritime Law and applies to maritime adventures only.

A general average loss is a loss caused by or directly consequential on a general average act. It includes a general average expenditure as well as a general average sacrifice.

There is a general average act where any extraordinary sacrifice or expenditure is voluntarily and reasonably made or incurred in time of peril for the purpose of preserving the property imperilled in the common adventure.

A general average sacrifice is a loss of or damage to either ship or cargo purposely caused in order to save the whole adventure from perishing.

A general average expenditure is a reasonable extraordinary expenditure necessarily made or incurred by one or more of the parties for the general benefit of all the interests embarked in the enterprise.

In order to constitute a general average four things must be borne in mind:

I. The existence of an imminent peril common to ship and cargo.

II. A voluntary sacrifice of part of a maritime adventure to save the remainder or a reasonable extraordinary expenditure voluntarily incurred for the safety of the whole.

III. A successful result. In other words, there must be a deliverence from the peril threatening physical injury to the whole adventure.

IV. An absence of fault on the part of those claiming contribution unless there is a valid agreement to the contrary in the bill of lading or contract of affreightment.

For a fuller and clearer understanding of what constitutes a general average a study of chapter No. 1, entitled General Principles, in Mr. Congdon's book on General Average, would be enlightening.

PROPORTIONATE CONTRIBUTION.

A general average contribution is defined to be a contribution

by all the parties in a sea adventure to make good the general average loss. Such loss is contributed to proportionately as the palties concerned are benefited, and it matters not ultimately whether the vessel or cargo is called upon to suffer in the first instance for the common benefit, the loss being equalized in the final adjustment with the result that whoever has suffered the loss is placed on an equality with those whose interests are saved intact.

The three great maritime interests concerned in a sea adventure are the ship, cargo and freight,—freight being the amount paid under the bill of lading for the carriage and delivery of the cargo.

In discussing how a general average adjustment is made up and settled, as each case has to be dealt with by the adjuster according to the facts of that particular case, my remarks will be limited to the general procedure where New York is the termination of the voyage.

When a general average occurs the adjuster advises the steamship agents not to release any cargo as far as the general average is concerned until advised by the adjuster that the average bond has been signed by the consignee of the cargo. A copy of the manifest is obtained and average bonds drawn up for consignees' signatures. In addition to the signature to the average bond, security is obtained in the shape of an underwriter's guarantee provided the underwriter has funds on deposit in this country. If the goods are uninsured or insured abroad the consignee puts up cash security, this being an estimated percentage of the value of his goods and being a provisional payment subject to the amount actually found to be due upon completion of the adjustment. If the cargo has been damaged by a general average act the adjuster appoints an appraiser to survey the damaged goods and agree upon their disposition. In cases where heavy damage by a general average act is suffered by the cargo, cargo underwriters take steps to obtain security from the ship for the vessel's proportion of the general average, and in some cases, if necessary, libel the vessel.

The estimated percentage of general average is arrived at by obtaining the estimated values of ship and cargo and applying same to the estimated general average loss in respect of ship and cargo and such incidental general average expenses as have been and are to be incurred.

Where the owner of the cargo refuses to sign a bond and furnish security as required, the vessel's agents file a lien for the estimated general average with the custom's officials and the goods are sent to public store and cannot be removed until the lien has been satisfied, this being in accordance with Revised Statutes, Section 2981.

If the general average is due to a casualty occurring within the limits of any port of entry, the adjusters advise consignees to enter damaged goods for duty purposes under Section 2984, Revised Statutes, so as to obtain a rebate on account of damage sustained.

In the case of general average due to a casualty occurring whilst at sea, the adjusters advise consignees to enter for duty purposes damaged goods for appraisement under Section 2926 of the Revised Statutes. While this statute is obsolete the Department at Washington decided under date of January 16, 1915, that, "In proper cases an appraisement entry on goods damaged on the voyage of importation may be permitted. Application for appraisement in such cases should, however, be submitted to the Department for decision."

In case of damage to cargo by a general average act while on board a vessel which, during the voyage to United States Ports has been damaged to such an extent as to be rendered unseaworthy and the cargo is delivered by other vessels the adjusters advise consignees to enter for duty purposes damaged goods for appraisement under Section 2928 of the Revised Statutes.

In all of these cases the adjusters also request the vessel's agents to communicate with the Secretary of the Treasury and make application for the damaged goods in such cases to be dealt with in accordance with the Statutes referred to.

All these measures are promptly attended to by the adjusters with a view of minimizing the loss occasioned by the disaster. In the meantime the logbooks are obtained and the protest drawn up and sworn to so that the facts in the case become a matter of public record.

The adjuster also obtains from the master and chief engineer of the vessel such other data, together with documents in substantiation, as may be required in connection with the case.

After the cargo has been signed for and proper security taken, value statements are sent to the consignees to obtain the saved value of the cargo delivered for purpose of contribution to the general average. At the same time consignees are requested to file with the adjusters claims for damage to their goods caused by the general average act. The value statements are carefully examined by the adjuster and the market values and landing charges checked, and in a great many cases are referred back to the consignees either for correction or explanation.

As cargo nowadays is usually insured, consignees file their claims direct with the underwriters rather than await the completion of the adjustment and the underwriters generally file their claims with the adjusters as soon as they have settled with the assured. In stepping into the consignees' shoes underwriters

have a vital interest in having an unfortunate matter settled as soon as possible.

The claims are examined by the adjuster and made up in accordance with the survey report of the general average appraiser, being based upon the market values submitted by the consignees and approved by the adjusters.

The extra disbursements are usually paid by the steamship agents and upon receipt of the account of extra disbursements, together with the bills and survey reports upon the vessel, if damaged, same are carefully examined by the adjuster. This entails considerable work both in correspondence and in consultations in order to determine whether the expenses were due to the general average act and were for the common benefit. The repair bills are carefully gone over with a surveyor and the items of general average repair separated and agreed upon according to the rules of adjustment governing the case. Where a tender for repairs is accepted according to specifications the cost therein of the general average repairs is obtained from the repairers. Lastly, a certificate of valuation of the vessel in damaged condition is obtained from an independent expert.

MAKING UP PROOFS.

All the necessary data simplified and free of as much detail as possible, yet putting same into comprehensive form, is copied by the adjuster in his rough statement and the general average account closed. The apportionment as to vessel, cargo and freight is then made, followed usually by the apportionment for the cargo interests, after which comes the settlement. The rough copy is then handed to the printer for lithographing and binding and the required number of copies as estimated by the adjuster printed. After being printed they are distributed to the interested parties. As soon as the interested debtors have had a reasonable opportunity to examine the adjustment, the adjuster asks for payment. When all collections have been made, settlement is made with the credit interests upon proper proof of title to the credits being exhibited or surrendered to the adjuster.

I have covered the ground in but a small way, omitting many of the phases which crop up in every case. From my remarks it can readily be seen that the adjuster's position is that of an impartial arbiter of a general loss concerning all interested in a maritime adventure. The members of the underwriting profession do not entirely agree with the latter remark, in view of the fact that the average adjuster is usually named by the ship-owner, but in a large number of cases the cargo interests are frequently the creditors and the ship the debtor. Especially is this true in fire cases, where most of the damage sustained

is on cargo damaged by water or steam used to prevent the fire from destroying the whole adventure.

In conclusion for those who desire to delve into the law of general average, Congdon on General Average is the latest publication that thoroughly covers both the practice and the law in this country, Lowndes on General Average being the best English treatise on this subject.

SHIPPING BOARD INSURANCE
and Marine History in the United States.

By Robert H. Pearson.

There is a world of romance in marine and war risk insurance, and no more fascinating subject than how men bravely risk life and property in submarine zones—their only protection the watchfulness of Uncle Sam and their own farsightedness in carrying ample insurance to cover property loss.

Through the policy which it has adopted the United States Shipping Board Emergency Fleet Corporation has been able to employ measures to protect the United States against all financial loss due to perils of the sea. Fires, accidents, acts of God—such as the effects of tornadoes, storms and heavy weather; breakage of machinery, explosions of boilers, all are provided for in the self-insurance carried by the United States Shipping Board Emergency Fleet Corporation.

For slightly more than one-half cent for every dollar value represented by ships, the United States Shipping Board insures its vessels against marine losses on voyages from transatlantic and Atlantic ports to European Atlantic ports. An additional four or five cents for every dollar of value represented by our vessels covers war losses, such as submarine sinkings, damage done by floating mines and attacks by enemy vessels.

Approximately $30,000,000 in premiums had been set aside by the Shipping Board up to July 29 this year.

Estimated losses of all kinds suffered by the Emergency Fleet, including damages of ordinary character, amount to about $13,500,000.

Among the largest losses sustained through collision was the loss of the steamship *Westerly* on her maiden trip, sunk in mid-ocean, entailing a loss of $1,500,000.

Other large losses due to submarine sinkings follow:

Ex-German Vessels.	Loss.
Actaeon	$1,250,000
Chatahoochee	2,000,000
Owasco	500,000
President Lincoln	3,000,000
Total	$6,750,000

Vessels Commandeered.	
Steamer *Lake Moore*	500,000
Steamer *Florence H.*	1,000,000
Carolina—probably exceeding	500,000
Pinar del Rio—probably exceeding	450,000
Winneconne	400,000
Grand Total	$9,600,000

Since taking the chairmanship of the United States Shipping Board, Chairman Edward N. Hurley has made it a basic policy to surround himself with the best experts in their official lines that can be obtained. It was this policy which brought to the insurance committee of the Shipping Board the services of Hendon Chubb, of New York, H. F. Eggert, of New York, and W. R. Hedge, president of the Boston insurance company. It is through these experts all insurance problems must pass.

ROMANCE OF THE "ORLEANS."

Illustrating one of the romances of the insurance world, members of his staff recalled handling the marine insurance of the *Orleans*. This vessel braved the submarine zone a short time after the Germans had declared ruthless warfare against all vessels entering the so-called barred zones unmarked by the ridiculous striped effect Germany ordered Uncle Sam's vessels to wear. This vessel and the *Rochester*, another freighter, were the first to show the Germans, with whom we were not at war at the time, that our merchant marine would continue to sail the American flag in the face of threats to sink without warning.

For a year both vessels successfully evaded submarine attack, although several times pursued. Within the last six months the enemy got them. The *Orleans* and the *Rochester* are now with the green Navy. But due to marine and war risk insurance their owners were enabled without risk of financial loss to operate for about a year between an Atlantic port and Europe shipping food and munitions to our Allies.

The history of marine and war risk insurance in this country goes back to early colonial times. Its most interesting phase may be said to date from the beginning of submarine activity by the Germans in the Fall of 1914. It was then that rates soared to unheard heights. Such marine insurance not carried by foreign insurance interests at that time was handled principally by 35 large American companies.

German, Russian, Australian, Swiss, Chinese, Japanese and British companies did the principal business done by foreign marine insurance companies in this country in 1914 at the outbreak of the war. The largest business was done by Lloyds of England. German concerns have since been taken over

and are now being liquidated under orders issued by the Treasury Department.

Such marine insurance in the United States as is now provided by foreign insurance companies or American concerns is now being written by American underwriting concerns or by navigation companies themselves through the self-insurance plan. War risks are being carried by the United States Government Bureau of War Risk Insurance.

THREE PERIODS.

There are three distinct periods in marine insurance in America. Until 1794 insurance written in this country was carried by individuals or partnerships. The first insurance office doing marine insurance was opened by individuals in the colonies in 1721. It began business in Philadelphia. New York, or as it was then known, New Netherlands, opened its first marine insurance office in 1759. Most of the business even in those early days of our history was held by Lloyd's of London.

In 1794 the general assembly of Pennsylvania gave the first charter to a corporation to do marine insurance. Numerous others followed. From 1790 to 1805, a period of fifteen years, the rapid development of American merchant marine was reflected in the number of insurance companies that came into existence during that time.

The two decades preceding the Civil War constitute the most prosperous period of ship development. Marine insurance plainly evidenced this in the tremendous amount of business written in this country.

Four years of civil warfare heavily handicapped the marine development, and shipping fell off, only the strongest companies surviving. Tonnage dwindled, until American oversea shipping had declined into a mere shadow of what it was in the days of prosperity.

Marine insurance probably had something to do with the rapid decline of the American merchant marine of those days. Lloyd's carrying a good part of the insurance business of the world gave a ruling in the middle of the nineteenth century rating iron vessels higher than wooden ones. As most of the iron vessels at that time were British our wooden ships fast lost their grip on what remaining trade this country had overseas, and the more favored iron vessel made rapid inroads.

CONCRETE SHIPBUILDINC IN THE UNITED STATES.

By Robert H. Pearson.

Consulting Engineer, Globe Indemnity Co., New York.

A practically new industry is now in progress in this country and indications show that concrete shipbuilding will become a very important business in the near future, so much so, that I feel that an interest in the subject is timely and that insurance underwriters and inspectors should prepare themselves in advance for work of this type.

Uncle Sam is backing the concrete ship as a factor to beat the U-boat. The Shipping Board will invest $50,000,000 in building that type of vessel. Five government yards are to be constructed in addition to the three private ones now operating. Two of these will be on the Atlantic coast, two on the Pacific and one on the Gulf of Mexico. The immediate programme calls for forty-two ships with hulls of reinforced-steel concrete, and this is only a beginning.

Why the concrete ship? In what ways is it better than the wooden or steel one? What has led the government to put its faith and its money in stone ships?

The answer is simple: They add to our total tonnage without interfering with the construction of other boats. Materials required for constructing concrete vessels are available in necessary quantities all along our coasts and waterways. Little skilled labor is required. Concrete vessels can be constructed rapidly. Concrete ships are reasonable in cost. Concrete ships will not burn. Concrete ships are rotproof and ratproof. Concrete vessels can be kept in constant service because there are few maintenance requirements. Concrete ships built to supply present needs will be equally useful after the war, when industry will demand shipping facilities probably even greater than at present. Concrete has been used in every form of construction. It is a known quantity. Ships can be designed in concerte to meet every requirement.

For more than a year the call has been for ships, more ships, and still more ships.

The first call meant steel ships, that should be built without interrupting the work upon vessels for our navy. The call "more ships" meant that we must increase our output without in-

terfering with the construction of our warships or the enormous production of steel ships. We turned to building shipyards and to producing wooden ships in quantity. That seemed about the limit—wooden ships.

The "and still more ships" meant that Uncle Sam must extend himself and build ships without embarrassment to our navy, to the steel programme, or to the enormous work going on in building wooden ships. The men to answer this almost impossible call for "still more ships" were not found wanting. They would furnish the government with an enormous fleet of ships built of reinforced concrete.

FRENCH CONCRETE LIGHTER.

Two years ago the world would have laughed if any one had suggested a self-propelling seagoing ship built of stone. To-day it is an accomplished fact.

The *Faith,* built in record time, has weathered the high seas and is sailing them victoriously. With that demonstration of the valiant ship *Faith,* the shipbuilders are preparing to remove mountains of concrete and convert them into ships—"and still more ships."

Concrete ship construction now being undertaken by the United States Government includes vessels of approximately 3,000-ton, 3,500-ton and 7,500-ton cargo-carrying capacity.

To utilize the already designed and partly manufactured engines and fittings for the Fleet Corporation's standard wooden ships, the first standard concrete ship was made of approximately the same capacity, dimensions and form, except that the sheer line amidships of the concrete ship has been slightly altered and no exterior keel is fitted. The general arrangement of the ship itself and of the propelling machinery is the same in both types. The ship is of single deck over its full section, with a poop deck at the stern, a forecastle deck at the bow and a bridge deck, with a wood frame cabin house amidships. A single screw operated by a 1,400-hp. reciprocating engine located amidships will give a speed of approximately 10½ knots. The boilers may burn either coal or oil.

The vessel has a length over all of 281 ft. 10 in.; a length between perpendiculars of 268 ft.; beam over shell of 46 ft.; depth amidships at sides of 28 ft. 3 in., and a loaded draft of 23½ ft. The weight, which is 2,972 tons, has a carrying capacity of 3,202 tons, and a full-load displacement of 6,175 tons. It compares closely in these dimensions with the similar wooden ship of somewhat larger dead-weight carrying capacity, but it is nearly twice as heavy empty as a steel ship, similarly rated, which has a carrying capacity 10 per cent. greater. Estimates of cost by the Shipping Board are between $100 and $125 per ton for concrete ship dead-weight carrying capacity as against $165 for wooden ships and $180 to $220 for steel ships.

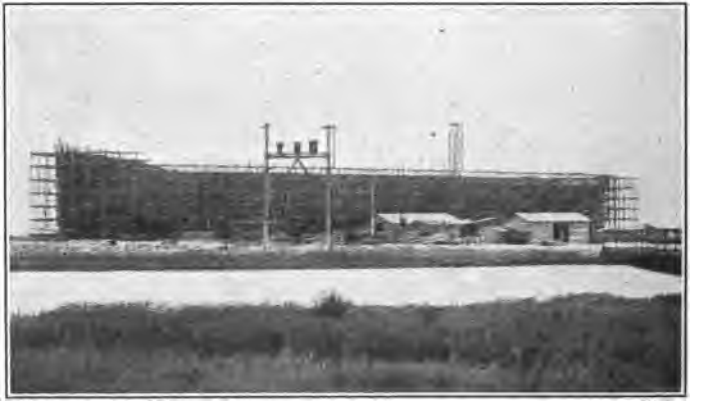
In the general shaping of the hull very little change from the standard wood ship has been made as a concession to the use of concrete. The midship section, which continues for about 35 per cent. of the length, is practically square. There is a slight batter in the bridge-deck bulwark and a rise of 9 in. in the bottom from the center to the bilge keelson.

Stiffness of the bottom is aided by one center keelson and two bilge keelsons, the former turning to make stern and stem posts and the latter following the curve of the hull and ending at the collision bulkheads. These keelsons are concrete girders reinforced with rods in their upper and lower sections and tied together with frequently spaced stirrups. They frame into the transverse frames of the vessel, which are spaced 5 ft. apart on centers. These frames are reinforced-concrete girders turned at the corners to meet the curve of the hull and re-entering at the main deck to form the transverse deck girders, which carry the deck and serve as crossbraces for the side members of the frames. The bridge deck bulwark is in effect a continuation upward of the shell of the ship, being formed of girder frames and an outer shell. It is provided with an expansion joint about amidships. The main frames are additionally stiffened by longitudinal, horizontally placed stringers about three-quarters of the way up the frame.

Integral with the main frames is the shell, a continuous reinforced-concrete plating 5 in. thick on the bottom and up to a point 6 ft. above the base line, and 4 in. thick through the remainder of the hull to the deck line. The main deck is also a 4-in. reinforced-concrete slab, continuous except for the hatch openings, which are stiffened by the usual combings.

The shell is reinforced at its outer and inner faces with ½ to ¾ in. square bars running around the shell parallel to the water line and spaced at distances varying from 4 to 12 in. c. to c. These rods are designed to be placed 1¼ in. from the face of the concrete on both outer and inner faces.

In addition, there are vertical ¾ in. shear bars between the horizontal rods spaced on varying centers. They extend around the entire shell and deck.



THE "FAITH" WHEN UNDER CONSTRUCTION.

Between hatches in the cargo holds the deck beams have intermediate supports in the way of reinforced-concrete stanchions designed as columns, these stanchions being braced longitudinally at about half their height with reinforced-concrete struts. In the stern half of the boat the shaft tunnel is of reinforced-concrete framing and the stanchions are supported on the crossbeams in the shaft-tunnel roof, which in turn span between short posts on either side of the tunnel.

Foundations for the engines and the boilers are on steel plate girders footing on an extra framing of longitudinal reinforced-concrete girders running parallel to the keelsons.

Four transverse water-tight bulkheads are provided. Two are

collision bulkheads near the bow and the stern and two enclose the engine-room space. The engine-room bulkheads are slabs stiffened by vertical beams extending from short stringers in the bottom between two frames to similar stringers framing into the deck beams.

A special effort has been made to avoid sharp turns in the steel reinforcement, particularly in the main frames, which are turned on long radius curves. Steel reinforcement in the hull will be ½ and ¾ in. in diameter. All reinforcement will be continuous, though the exact method of insuring this continuity has not yet been decided. Neither has the exact nature of the aggregate been settled, although experiments have been made with various light-weight aggregates which seem to promise a possibility of a concrete weighing less than 11.0 lb. per cubic foot with a strength of 4,000 lb. per square inch at twenty-eight days.

For all these conditions of loading the frames were designed to have stresses not to exceed 16,000 lb. per square inch in the steel and 1,500 lb. per square inch compression in the concrete. Bulkheads were designed to carry a head of water on either side up to the deck. The collision bulkheads fore and aft were designed for 1,500 lb. per square inch in the concrete and 16,000 lb. per square inch in the steel. Steel stress in the engine-room bulkheads was advanced to 20,000 lb. per square inch. The deck was designed to carry 5 ft. of water or its equivalent, which is somewhat in excess of the loading on the decks of standard steel ships being built by the Emergency Fleet Corporation.

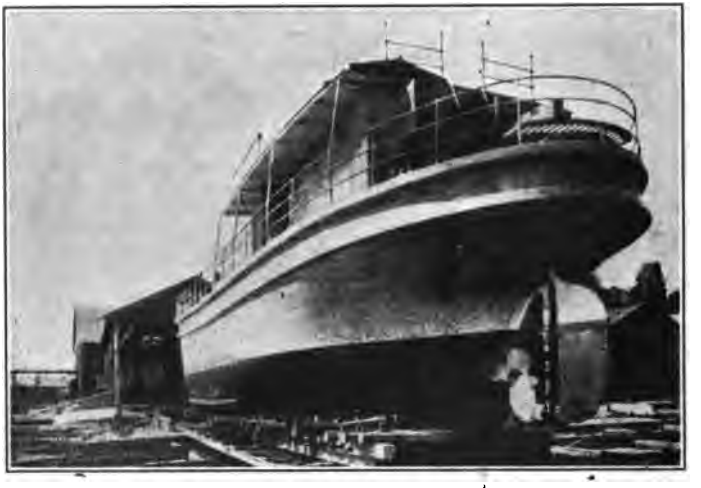
Extra strong and a more plastic concrete is expected to be achieved by the use of a specially fine cement. Any standard Portland cement which will meet the government specifications may be used, provided the fineness is increased so that at least 90 per cent. will pass a No. 200 sieve. This is hoped to give a concrete of 4,000 lb. per sq. in. compressive strength at the end of twenty-eight days.

With a standard 150-lb. concrete it is estimated that the ship will contain 1,761 tons of concrete, 400 tons of reinforcement steel and 811 tons of wood, fittings, machinery and equipment, making a total of 2,970 tons. That is, the steel in the reinforced-concrete ship will be about one-third of the amount of steel in the steel ship of equal capacity.

Concrete boats are not new. As far back as 1849 Mr. Lambot, of Carces, France, built a rowboat of reinforced concrete. The process of construction was patented and the maker exhibited his work at a world's fair held in Paris in 1855. This as far as we know was the first example of combined steel and concrete work or reinforced-concrete used in a practical way for any purpose.

In 1899, Carlo Gabellini, of Rome, Italy, began the construction of concrete scows and barges. His process had been so developed by 1905 that a 150-ton barge was constructed for the city of Civita Vecchia. The following year another barge was built for the military harbor at Spezzia, for use of the Italian navy. This latter barge before acceptance was put to the severe test of being driven against some piling and afterward being rammed by a steel towboat. Results of these tests were so satisfactory that construction of similar boats or barges followed.

The first step in "laying down" these vessels consists of placing reinforcement for the keel and ribs. This reinforcement,



400-TON NORWEGIAN MOTORSHIP.

which usually consists of round steel rods, is then covered on the outside with ¼-inch wire mesh, to which a 1-inch coat of cement mortar is applied by hand. Next, a somewhat thinner coat of mortar is placed on the inside, following which forms for the ribs and keel are put in place and concrete deposited for these parts of the vessel. These ribs run both longitudinally and transversely, so that a checkerboard arrangement results, the pockets being 10 inches deep and the ribs about 2 inches wide. Over these ribs ⅛-inch wire mesh is placed with a thin mortar covering plastered on. Finally a third and a coarser wire mesh is pressed into the soft mortar and the entire

surface troweled over. This completes the hull. Bulkheads are next concreted and the boat finished with a wooden sheer strake and gunwale.

MODERN METHODS AS PROPOSED BY VARIOUS ENGINEERS.

Not long ago a system of concrete ship construction was invented and a patent applied for by Carl Weber, 910 South Michigan Avenue, Chicago, a well-known concrete engineer and president of the Cement Gun Construction Co., Chicago. The method patented by Mr. Weber is now being promoted by the Torcrete Shipbuilding Co., of Chicago, which plans to establish plants at various points for the construction of concrete ships of different types.

The method proposed by Mr. Weber consists mainly of:

(1) A skeleton of structural steel with members running transversely and longitudinally throughout the hull.

(2) A system of reinforcing steel rods supported by the skeleton.

(3) A layer of wire mesh or fabric placed outside of the steel rods.

(4) The concrete shell in which the reinforcement is embedded.

Concrete is applied by means of a modified cement gun, the modification consisting in dividing the hydration into two stages, and in a special mixing process. Concrete is applied directly to the assembled steel framework, no forms being required other than a sort of shield held on the side opposite from which the concrete mixture is being applied and directly at the point of application. This shield may be slid along as the application of concrete or cement mortar progresses. When concreting has been completed and the concrete has hardened, the exposed surface is rubbed down to a fine smooth finish by means of rotary grinding machines. This method, eliminating as it does the usual form work, should make for great rapidity of construction.

E. Lee Heidenreich, consulting engineer, Dwight Building, Kansas City, Mo., contemplates the construction of a concrete hull with double sides and bottom. The space between the inner and outer shells is divided into compartments by means of short concrete spacers, the object of which is not only to carry the construction from one shell to the other so that the entire hull acts as a monolith, but also to divide the space between the two shells into water-tight compartments. The use proposed for these compartments is storage of fuel oil.

The concrete in the hull is reinforced by steel rods and wire mesh, forms being necessary so that the concrete can be placed

in the usual manner. In the case of large vessels it is proposed to use sliding forms which could travel along the length of the vessel as concreting progresses. These forms will be left in place long enough only for the concrete to harden sufficiently to permit moving forms. This method does away with the large amount of form construction where forms must be built complete for the entire structure, and also permits some standardization of forms so that they may be used repeatedly in building other and similar ships.

A method of concrete ship construction devised by John J. Smith, concrete engineer, Old South Building, Boston, is somewhat similar to that just described, except that it is intended

CONCRETE MOTORBOAT BUILT IN MICHIGAN.

more particularly for vessels larger than those contemplated by Mr. Heidenreich's method. Briefly, the system proposes a double hull having an outer shell varying in thickness from 5 inches at the water line to 7 inches at the bottom, and an inner shell varying from 4 inches at water line to 5 inches at the bottom. As in Mr. Heidenreich's system, the two shells are separated by concrete spacers, and the space between hulls divided into a number of water-tight compartments. These can be used to store fuel oil. The concrete shells or sides are reinforced with steel bars running in both directions. The vessel is built in normal position and the concrete is placed in the usual manner between forms.

In the space between the inner and outer shell, there is a system of interlaced steel rods. The object of this mesh or interlacing of rods is to dissipate the force of any explosion, as for instance that of a torpedo, which might pierce the outer shell. According to Mr. Smith's description, they are designed to work after the same principle as the Maxim gun silencer. They would not only take up and dissipate the force of explosion, but also protect the inner shell against injury from flying pieces of concrete or metal.

Booker & McKechnie, concrete engineers of Halifax, N. S., have designed and patented a system of concrete boat construction that also involves a hull having two or more separate shells, according to the stresses to be sustained or opposed. The space between the various shells is divided into a large number of water-tight cells. Their method proposes for ocean-going vessels three thicknesses of shells under the bottom and two thicknesses from the bottom of the vessel up to water line and one thickness from there upward. The concrete is reinforced by means of suitable rods, the vessel being built in an upright position and the concrete placed between forms in the usual manner.

Concrete and Constructional Engineering (London) for October, 1917, contains an article by G. C. Workman, which describes the building of some large reinforced concrete barges for the port of Bahia, Brazil. The article is also accompanied by detailed drawings showing the principal features of this work. One barge is described as having been built in April, 1910, to be used for the transport of dredged materials. The dimensions are in metric measures, which, reduced to feet, give the following approximations: Length, 119 feet; beam, 22 feet; depth, 9 feet.

It would appear from the above proposition that each builder will adopt methods in producing concrete ships which will vary very much from the other. Where capital is available, whatever method is adopted, building within dry dock would appear to be the safest, quickest and best way to produce this class of ship.

Steel forms of a portable kind should give best results and while more expensive initially than wooden forms, where a contract is made for a number of ships of the same standard, they would in the long run be an economy.

It is to be assumed that men venturing their capital in this work will aim at getting the best mechanical equipment possible and installing said equipment in a permanent and proper manner for the better security of their interests.

Staging should be of good quality and well set up and the nature of the work will demand the very best class of material

and careful handling, thus disposing of dangers which attended concrete construction of other kinds in the past and which proved so disastrous to many liability insurance companies who handled this class of business.

RIVER MARINE UNDERWRITING.

By Oscar A. Smith.

Memphis, Tenn.

The statement made in a recent issue of THE WEEKLY UNDERWRITER, under the heading "River Business Undesirable," that the *Columbia* was operated while condemned, evidently was made under misapprehension, for the United States Government, through its various departmental hull inspectors, will not permit the operation of a condemned hull for freight carrying and certainly not for excursion business. It is possible but not probable that the boat had been condemned, then repaired and later passed. This does occur more than once during the life of a steamboat as well as with an ocean-going steamship. When one realizes that a broken plank, a strained seam or joint will cause a leak and consequently a condemnation, i.e., an order to put the vessel on the docks for repairs,—the fact that the vessel is condemned does not seem so serious.

Again, the comparison of the *Columbia* with the *Eastland* is odious—the accidents are not parallel, except in the fact that a loss of life ensued. The *Eastland* was a top-heavy lake steamer whose ballast tanks were empty at the time of the accident. Some even claim that the ebb of the Chicago River caused the boat to settle upon piling in the river bed.

River vessels from their breadth and shallow hulls are very stable even when carrying no ballast—and a river boat which finds it necessary to carry ballast is usually rebuilt or remodeled in such a way as to remove the topheaviness. This is usually secured by removing one story of her superstructure. The statement that the lessons taught by disasters are unheeded suggests that the underwriters of Western river risks are a careless lot, unheedful of obvious lessons to be learned from passing events. Such inference does this hardy group of underwriters great injustice.

At the present time there are two major groups of underwriters devoting attention to the underwriting of river hulls and cargo—insuring both marine hazards and fire. These people are as careful a lot of men as may be found in any line of insurance. They employ inspectors on an annual salary whose entire time is taken up in surveying the boats of the Western rivers. These

are Mississippi, Missouri, Ohio, Tennessee, Arkansas, White, St. Francis, Yazoo and Red rivers. Every risk carried is inspected twice annually, and oftener where possible. Any defects showing up are pointed out at once and correction required. If the defect requires docking, the owners are given the alternative of docking or having the insurance cancelled. A boat crossed out by one group of underwriters will hardly be accepted by another group until the defects are remedied.

These inspectors are men who have had years of experience on the river—men who are capable of putting on overalls and carrying on any work in connection with the operation of the boat or repairing or rebuilding any of its parts. We have in mind one gentleman who served as ship carpenter on the Western rivers, then as second mate, then as mate and later as captain. Another estimable gentleman has had like experience. When these gentlemen, experienced river men, acquainted with the whims, fancies and foibles of an habitué of the river, inspects a steamboat, he does not fail to find out all her weak and undesirable points as well as her good qualifications.

Some one has said, "One is no hero to his valet." This may be said with equal truth of a steamboat. So when our inspector partakes of the bowl of black coffee on the watch hours in a friendly group in the galley he hears all the gossip about boats and men from the uppermost navigable points to the mouth of the mighty Mississippi. If information about a particular boat is desired, it is but necessary to mention her name to have some of the members of the assemblage relate something about the boat's history.

Not having access to complete figures, I shall not comment on the loss ratio except to say that of the last few years the business generally has not been profitable, due principally to the unusual conditions existing on account of the war and the catastrophe of last winter. As far as volume is concerned, when compared with that volume of the ocean, the business is small, but when the commerce on the rivers is considered, one finds a respectable volume.

River steamers are no more frail craft than the seagoing vessels when one considers the stresses each must bear. The ocean vessel is of rigid type—the river vessel flexible. The thickness of the plankings on river hulls are thicker and heavier in proportion to the size of the vessels than those on ocean vessels, but the framing and ceiling are lighter on river steamers, which accounts for the flexibility and ability to stand a severe blow.

It is true there are shifting perils incident to river navigation—it is equally as true of ocean navigation. The United States Government maintains a River Commission which surveys and charts the perils of the river and establishes a system of lights,

which, when followed, safely guides the boat through. After each high water snag-boats visit the vicinity of the charted snags and remove the trees, logs and snags which imperil the safety of navigation. Any shallows showing up are dredged out by a fleet maintained by the Government for this purpose, thus keeping open a navigable channel for the deepest draft boats plying that stretch of water.

WAR RISK INSURANCE.
Important Changes During the War.

By Hendon Chubb.

Address Delivered Before the New York Marine Insurance Club.

When I was asked to speak at this meeting on the subject of war risk insurance I intended to take the lecture which I delivered to the New York University in 1914, using that as a basis and bringing it up to date, but in looking into the matter I recognize that the changes in the situation were so considerable that many of the factors which were important at that time and which had to be treated at more or less length, are now of little importance.

I will therefore confine myself to a consideration of the changes which have come about during the four years of the war, considering these changes from the point of view of the underwriter.

These changes have, on the whole, simplified the problem from the point of view of the war risk underwriter: many of the more complicated considerations have been removed and while other complications have been introduced yet in weighing war risks to-day you have to give consideration to fewer factors and the problem is less complicated than in 1914.

There are a number of causes which have brought about these changes, the principal being:

First—The unrestricted submarine warfare of the Central Powers.

Second—The extension of the theory of ultimate destination and as a sub-heading, the establishment of a system of cargo permits by the belligerents prior to shipment.

Third—The assumption by the various Governments of control over practically all importations and their distribution by the Governments.

Fourth—The search of vessels in harbor in place of search at sea.

Fifth—The entry of this country into the war and its changing from a neutral to a belligerent.

Taking these various points in order I will ask you to consider the extent to which they have brought about a change in

the consideration entering with the acceptance of war risk insurance.

UNRESTRICTED SUBMARINE WARFARE.

First—The unrestricted submarine warfare of the Central Powers. Prior to the first introduction of submarine warfare the risk of capture by the Central Powers was confined to the operations of their raiding cruisers which acted after search and were to some extent, at least in theory, guided by international law and while many of their acts seemed to us contrary to the accepted principles of international law, as an instance the sinking of the *William P. Frye,* yet in each case they at least sought to justify their act by these principles.

Following this case the first submarine warfare and with it an abandonment of all the principles heretofore recognized. True, at the start and after strong protests by our Government, there was some attempt to distinguish between vessels of belligerent and neutral flag but this was followed by the introduction of unrestricted submarine warfare, where any vessel found within a certain defined zone was sunk without inquiry and without warning, and as a result the following considerations were eliminated by the underwriter in determining the hazards incurred from the action of the Central Powers:

(a) The nationality of the carrier: Formerly of great importance, it is now as regards vessels to the submarine zone, practically eliminated. The only way in which the underwriter now has to consider it is in relation to the added danger to neutral ships by reason of their being unarmed and the convoy system has made this of less consideration than formerly.

(b) Destination of cargo: This is now only a matter of consideration on shipments to the war zone in so far as particular destinations are more or less exposed to the risk of encountering submarines, viz.: it is a factor from a naval point of view only.

(c) Ownership of cargo: This was formerly a matter of great importance, particularly when coupled with nationality of the carrier and destination of the cargo, but has now become a matter of no importance.

(d) Character of cargo whether contraband or non-contraband: This again as regards vessels to the war zone has become of no consequence.

To summarize the effect of the first of these changes to which I have alluded, it is that on vessels bound to European ports within the war zone, and a glance at the map is enough to indicate what an important part of European commerce this is, the underwriter in considering the hazards from the Central Powers has to consider one factor only, and that is the oppor-

tunity which the voyage gives for a successful attack by submarines or other war vessels.

ULTIMATE DESTINATION.

Second—The extension of the theory of ultimate destination: This theory was first advanced by the United States in the Civil War. The Allies have, however, extended this doctrine so that at the present time any article whose ultimate destination is the Central Powers is brought within its scope and presumption of destination is accepted by the prize courts as sufficient evidence upon which to base condemnation. They have also established a system whereby cargo intended for neutral points has to be licensed and any cargo not so licensed will be brought before a prize court with every probability of its being condemned.

The control of the seas by the Allies is so complete that underwriters, early in the war, were forced to recognize the conditions imposed by the extension of this theory of ultimate destination and the control of the lines of commerce by the Allies by declining to protect shippers against the risk of such capture. The exclusion usually came in either one or two ways, viz.: by the introduction of a clause reading substantially as follows:

"Warranted free from any claim arising from capture, seizure, arrests and restraints and pre-emption of Great Britain and/or her Allies."

Or a clause reading:

"Warranted no German, Austrian or ally thereof ownership, interest, consignee or destination and warranted free from condemnation on the ground of such ownership, interest, consignee or destination."

The second clause being written at a somewhat higher rate than the first but effectively disposing of the chances of loss through the operation of the doctrine of ultimate destination.

While the clauses quoted above exclude from the protection of the insurance a very considerable hazard to which such shipments are exposed yet if the shipper has satisfied himself that there is no enemy ownership or destination he can afford to run this risk uninsured because the belligerent governments have established a system of permits whereby the full information as to all such shipments is gone into before the shipment is allowed to go forward.

So here again as to cargoes destined to any port in Europe you have the four factors that were of so much imporatnce at the beginning of the war, viz.: the nationality of the carrier, destination of the cargo, ownership of the cargo and character of the cargo removed from the consideration of the underwriter when considering the risk of capture by the Allies, just as you

have the necessity for considering these factors on shipments to the war zone removed from the consideration of the underwriter when considering the risk of capture or destruction by the Central Powers.

CONTROL OF IMPORTATIONS.

Third—The assuming by belligerent Governments of the control and distribution of raw materials; this in itself has made less change than the first two factors I have referred to, the reason being that many of the changes which this would by itself have brought about have been also brought about by the first two considerations so that in considering this I will simply draw your attention to the fact that at the commencement of the war, following the old international practice, contrabrand lists were issued by each Government and the underwriter had to consider very carefully not only whether the shipment insured was absolute contraband but whether if conditional contraband the consignee was such or its ultimate destination was such that the courts would consider it contraband.

The conditions under which conditional contraband became actual contraband were: when destined for the use of the forces of the enemy or the enemy's government including an agent of the Government or contractor of the Government. You will see that as soon as the Government took control of a commodity it, by that act, come into the category of absolute contraband but as I said before, the condition brought about by the unrestricted submarine warfare and the retaliative actions by the Allied Powers including the broad extension of the theory of ultimate destination make the consideration of contraband or non-contraband of no practical importance at the present time.

SEARCH IN HARBOR.

Fourth—The search of vessels in harbor in place of the search at sea. In former wars a vessel was boarded at sea and examined and if found to have papers in order and no special ground for seizure, was at once released and proceeded upon its voyage, the search in itself bringing no particular hazard. During the present war, vessels destined for neutral ports have been taken into a belligerent port for search. In some cases the vessels have been taken in under arrest, in other cases, to avoid trouble of arrest, vessels have been routed via these ports of search. The entry into an additional port carries with it certain additional hazards even in times of peace; in time of war there are not only these hazards but the additional hazards caused by the removal of lights and the hazard of mines and when a loss occurs during the entry or leaving of a port of search and many such losses have occurred, there at once arises a question as to whether the loss is covered under the war risk provisions

of the policy or under the marine. This in each case depends upon the exact facts and is decided on the principle of proximate cause. It is unquestionably an additional hazard both for the marine underwriter and the war risk underwriter to consider and a loss arising under certain circumstances may, under other circumstances, that vary to only a slight degree by a claim under either the marine or the war risk policy.

I think that underwriters had, in a general way, considered that any strandings or loss by collision in these circumstances would fall under the marine perils, not that they did not appreciate that the question would be one of proximate cause but because in view of the Hatteras Light decision they felt that under existing conditions, as a rule, the proximate cause of a loss such as referred to would be held to be due to marine peril.

The *Canadia* case is one in point. I heard this discussed a great deal before the decision and I think the consensus of opinion among underwriters was that the loss in this case would be found to be one due to a marine peril although there was not only a difference of opinion but a recognition by all that it was going to be a close point. The decision that it was a war peril attracted a great deal of attention as a new and pertinent application of the old doctrine of proximate cause.

UNITED STATES AS A BELLIGERENT.

Fifth—This country becoming a belligerent has affected the war risk underwriters in a great many ways. While unrestricted submarine warfare with the retaliative measures of the Allies and the extension of ultimate destination removed from our consideration the importance of the nationality of the carrying vessel to European war zone ports until our entry into the war on voyages other than those to Europe or the war zone the question of nationality of the carrying vessel was of the greatest importance; but with our entry into the war this has become of minor importance because of the risks we have to consider probably ninety per cent. of them have belligerent destination or point of shipment and with our entry into the war not only was the character of our vessels changed from those of a neutral to those of belligerent but also the last bar to illegal action by Germany was removed so that while the question of neutrality of vessel and ownership of cargo may be of importance between neutral ports yet it can be disregarded as a factor in considering voyages between belligerent ports. If you will consider the matter you will see that these comprise practically the whole business coming before American underwriters.

In addition to the changes enumerated there are two others to which I wish to bring direct to your attention. They are, first—

EMBARGOES.

There is nothing new in the idea of embargoes, but this present war has seen them used in ways and to an extent differing materially from previous experience. They have been extensively used by the various belligerents; sometimes with the object of keeping shipments from going indirectly to the enemy, at other times with the object of conserving freight space, sometimes with the object of curbing the importation of luxuries and unnecessary articles and in other cases to preserve essential raw materials which the country is producing. In any case they amount to a restraint and were it not for certain clauses in the war risk policy, would be a matter of requiring careful weighing by underwriters. It is probable, however, that in few cases losses due to these embargoes are recoverable under the ordinary war risk form. In the United States our policy confines the protection against restraint to restraint by belligerents and in addition all forms of insurance in the United States now exclude claim arising from action by the Government of the United States and in practically all, the insurance is also warranted free from claim on account of the act of Great Britain and/or her Allies. In England the customary clause only covers capture, seizure, detention, etc., when arising from the act of the enemies of Great Britain or the enemy of the country to which the assured or the ship belong. Therefore at the present time, the question of loss through embargo can be to a great extent disregarded by the underwriter as it is a risk that in most circumstances falls upon the owner of the merchandise and not covered by ordinary marine or war risk insurance policies.

FEWER AIDS TO NAVIGATION.

The second point is the fact that strandings and collisions are very much increased by the removal of lights on shore and by the sailing of vessels without lights. This latter risk is very much increased by the fact that vessels are now proceeding in convoys and hence the risk of collision due to the proximity of a number of vessels to each other is materially increased. Here again is an additional peril that may fall on either the marine underwriter or the war risk underwriter.

Under the French and Italian law apparently a collision while navigating without lights is a war loss: under our law and under the English law it will depend upon whether this navigating without lights is found to be the proximate cause or not. The decisions since the war have seemed, on a whole, to indicate a broadening on the part of the court in viewing this matter and it is probable that decisions will show more of these cases traced to a war peril than underwriters would have anticipated from pre-war decisions: not that the principle has changed in any

way but that the interpretation seems to be somewhat broader.

In conclusion I wish to summarize the situation which the war risk underwriter has to face at the present time as against that which confronted him in the early days of the war. For the reasons before given the considerations which guided him have been reduced. This does not mean that the dangers of the business have been reduced but it means that the knowledge of international law, contraband lists, blockade notices, etc., have little real weight in considering risks at the present time. The present underwriting is based almost solely on a judgment of the naval situation as it exists at the time and as it may be changed during the currency of the voyage. Outside the submarine zone it depends almost altogether upon the existence or possibility of German raiders, submarines or cruisers and on voyages to the submarine zone depends principally upon an estimate of the decrease or increase effectiveness of the submarines but coupled with this must always be the consideration of the possibility of the Central Powers introducing a number of large cruisers on the Trans-Atlantic lanes, give their willingness to sacrificing the vessels and there is little doubt but that this could be done and that the consequent destruction would be enormous.